DATE: September 21, 2000

FROM: James G. Powers, Director
Office of Management and Operations Support, MA-4

TO: Directives Points of Contact

SUBJECT: DOE G 241.1-1A, GUIDE TO THE MANAGEMENT OF SCIENTIFIC AND TECHNICAL INFORMATION

This is to notify you that the subject Guide has been posted in the "draft" section of the Explorer system for your review and comment. This Guide supplements DOE O 241.1A, "SCIENTIFIC AND TECHNICAL INFORMATION MANAGEMENT," which is currently being coordinated on REVCOM. The Guide is being revised to update sections related to special handling of scientific and technical information products, metadata, and electronic transition.

Comments on the Guide are due October 23, 2000. Guides now have a separate coordination process in the directives system. Guides will be posted in the "drafts" section of Explorer for simultaneous use and coordination. Comments on Guides should not be designated "major" or "suggested", as in the past. From this point on, comments on Guides should be simply labeled as "comments". Please refer to the memo from James G. Powers, dated March 31, 2000, subject: Management of DOE Guides. The following procedures should be followed for the submission of comments:

Directives Points of Contact at Headquarters Elements: Submit one set of consolidated comments to the originator of the Guide by October 23, 2000: Kathy Waldrop, U.S. Department of Energy, Office of Scientific and Technical Information, 175 Oak Ridge Turnpike, Room 106, Oak Ridge, TN 37830; fax 865-576-3826; internet: kathy.waldrop@ccmail.osti.gov.

Send an additional copy of comments to Gail Cephas, MA-4, Room 4B-245, Forrestal, fax: (202) 586-1972, or Internet address gail.cephas@hq.doe.gov.

Directives Points of Contact at Field Elements: Submit consolidated comments to the writer as well as a copy to MA-4. The package submitted by Field Elements shall include as an attachment the comments provided by contractors.

Contractors will submit comments directly to their appropriate Field Elements.

Questions concerning the content of the Guide should be directed to Kathy Waldrop, 865-576-1223; Internet address: kathy.waldrop@ccmail.osti.gov. Questions on the directives system should be directed to Gail Cephas, MA-4, (202) 586-1049, Internet address: gail.cephas@hq.doe.gov.

DOE G
241.1-1A

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GUIDE TO THE MANAGEMENT OF SCIENTIFIC AND TECHNICAL INFORMATION

U.S. DEPARTMENT OF ENERGY
Office of Scientific and Technical Information

DISTRIBUTION:
All Departmental Elements

INITIATED BY:
Office of Scientific and Technical Information

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CONTENTS (continued)

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PART I

MANAGEMENT OVERVIEW OF DOE'S SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

1. INTRODUCTION

This Guide to the Management of Scientific and Technical Information provides nonmandatory guidelines for implementing the objective, requirements, and responsibilities of Department of Energy (DOE) O 241.1, SCIENTIFIC AND TECHNICAL INFORMATION MANAGEMENT. Because scientific and technical information (STI) is a key outcome of many of the Department's funded activities, STI has an important role in accomplishing DOE initiatives, missions, goals, and objectives. Providing effective management, protection, and access to unclassified (unlimited, sensitive, or export controlled) and classified STI is vital. The Office of Scientific and Technical Information (OSTI), within the Office of Science, is charged with the responsibility of coordinating the Department's Scientific and Technical Information Program (STIP) activities and ensuring that policies and practices are promulgated within the Department for managing STI resulting from DOE's research and development (R&D) and related scientific, technological, and environmental activities.

The Department is undergoing a transition to a decentralized, electronic STI management environment. The *Concept Paper on Electronic STI Management* (see Attachment 1) summarizes the decentralized activities envisioned in FY 1998 and lays the framework for that environment. This Guide reflects a number of procedural changes pertaining to the implementation of this transition.

Additional information about the Department's STI activities is located on OSTI's home page at http://www.osti.gov and also on the STIP home page at http://www.osti.gov/stip. Forms mentioned in this Guide are available on DOE's Forms Internet site at http://www.explorer.doe.gov:1776/htmls/doeforms.html and at http://www.osti.gov/stip/forms.

2. PURPOSE OF THIS GUIDE

This Guide is based on best business practices as defined by DOE and contractor STIP participants from across the DOE complex. The purpose of the Guide is to assist individuals who are involved in STI whether it is unclassified (unlimited, sensitive, or export controlled) or classified to meet Departmental expectations for ensuring access to STI and for managing STI throughout the various phases of the information life-cycle: planning, creation, publication, dissemination, and preservation. It complements other DOE directives relating to information security yet specifically addresses STI products. Information management policies, principles, and practices are evolving as new electronic technologies become available. This Guide is one of the primary STIP mechanisms for sharing "best-in-class" practices, and it will be modified and updated as changes are identified by the STI community.

2.1 Updating/Modifying This Guide

Because of the rapid changes in information technologies within and external to DOE, the usefulness of this Guide requires that it be kept up-to-date. Proposed changes to the Guide may be identified by anyone involved in STI and referred to as a STIP participant (an STI point of contact). Normally, items are discussed during regularly scheduled STIP meetings and are referred to one of the STIP workgroups to make a recommendation to the entire STIP community. Agreed-upon changes will then be incorporated into this Guide.

2.2 Source of Guide and Contact

An electronic version of this Guide is available through http://www.explorer.doe.gov/ and also through http://www.doe.gov/stip/polbest.htm. Questions concerning the Guide or recommended changes may be referred to the STI point of contact at the respective site or organization or to OSTI. To send suggestions or questions to OSTI, use the comment form on the STIP home page (http://www.osti.gov/stip.htm) or call OSTI's Office of Program Integration at 865-576-1035.

3. STI POLICY

An overarching DOE requirement is to make STI broadly available, within applicable laws and Departmental requirements, to—

- accomplish mission objectives and strategic goals,
- promote scientific advancement,
- satisfy statutory dissemination requirements, and
- ensure a fair return on Departmental and taxpayer investment.

Requirements and responsibilities for STI are provided in DOE O 241.1A. The primary objective of the Order is to ensure that STI is identified, processed, disseminated, and preserved to enable the scientific community and the public to locate and use the unclassified and unlimited STI resulting from DOE research and related endeavors. Additionally, the requirements and responsibilities provide a mechanism to manage and protect classified, unclassified sensitive, and export-controlled STI yet make it accessible for appropriate access by the Department, its contractors, and others. Attachment 2 lists relevant authorities and other guidance.

4. DEFINITION OF STI

STI consists of information products, in any format or medium, derived from scientific and technical studies, work, or investigations that relate to research, development, demonstration, and other specialized areas such as environmental and health protection and waste management. Scientific and technical information products may be unclassified unlimited, unclassified sensitive, export controlled, classified, or declassified. DOE-funded STI originates primarily from research and other activities performed by contractors for management, operation, or integration of DOE-owned/leased facilities,

direct DOE-executed prime procurements, DOE-operated research activities, and financial assistance recipients, in addition to DOE employees.

STI products and documents that provide findings, statistics, and analysis related to DOE research and development programs (excluding administrative documents) are appropriate for announcement to OSTI and are listed in Part II, Section 4, of this Guide.

Definitions are provided in Attachment 3 for other terms used in the management of STI.

5. SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

STIP is comprised of DOE program managers, researchers, and STI professionals who collaborate for the timely collection and broad dissemination of the Department's STI.

Strategic goals of STIP are to—

- provide access to DOE's STI,
- promote collaboration as a means of doing business,
- use best business practices for the life-cycle management of STI, and
- be customer-focused in providing STI products and services.

One component of the Department's STIP activities is the Scientific and Technical Information Coordinating Group (STICG). The STICG is made up primarily of representatives from Headquarters elements that either fund research or set policies or practices affecting STI. The group, chaired by the Director of OSTI, is cognizant of Departmental STI activities and serves as an advisory body on crosscutting STI issues and initiatives.

Although OSTI has the responsibility to coordinate STIP, the success of the program depends on the active participation and involvement of each of the STI representatives from the various DOE programs, field offices, and contractors. Activities are coordinated through DOE Technical Information Officers, who are the designated STI points of contact at DOE operations and field offices, to STI managers and STI points of contact at major contractor-operated facilities and the national laboratories.

6. STI PROGRAM REVIEW/ASSESSMENT

Paramount among the recent management reforms within the Federal government is the Government Performance and Results Act of 1993, which requires agencies to —

- focus on program outcomes,
- establish measurable annual objectives that link to long-term goals,
- develop budgets that are based on planned performance, and

- report results.

DOE has initiated a number of management changes as part of that reform. Those relevant to STI include the following:

a. Review and oversight of laboratory performance under performance-based management contracts, primarily through performance measures and self-assessments. Other influences on the annual laboratory evaluation include peer reviews, program office evaluations, external reviews (e.g., Office of Inspector General, Government Accounting Office), and day-to-day operational experience.

b. The Business Management Oversight Program, where STI management/administration was identified as a specific functional area. Performance objectives were established for the FY 1998 Headquarters review of Field Federal Activities (agreements were negotiated between OSTI and each operations office). Some of those agreements have begun to be referenced in operations offices oversight of contractor activities.

c. The most recently issued DOE Strategic Plan (of September 1997) included strategies for improving the management, dissemination, sharing, and use of STI across DOE, and for delivering and expanding access to DOE's technical information. These strategies appear in the Science and Technology business line.

d. With STI being recognized as a key outcome of R&D and related activities, initiatives have begun for placing STI as a component of technical program reviews and of the laboratory appraisal process.

e. The Department's first STIP Strategic Plan was issued in September 1997 (see Part I, Section 5), thereby establishing goals and strategies for the DOE's STI community and its activities. The overarching goal is the Departmental initiative to transition STI activities to an electronic environment.

Those who either sponsor activities that produce STI or who conduct or manage activities that are within the STI life-cycle should consider the points listed above as well as the information below for review or assessment of STI.

6.1 STI Performance Objectives

The following four STI performance objectives have been established for use in the Headquarters Review of Field Federal Activities Business Management Oversight Program. They are intended to complement and help assess progress in accomplishing the STIP strategic goals. Specific measures and expectations for each objective are to be developed by the appropriate program manager when being applied to program reviews, or by the operations office for contractor assessments on a case-by-case basis.

Objective 1: Provide access to STI by making it available to OSTI.

- Non-management and operation/integration (non-M&O/M&I)-generated STI deliverables are made available to OSTI in a timely manner.

- Useful M&O- or M&I-generated STI products are made available to OSTI in a timely manner.

Objective 2: Transition is being made to a decentralized electronic environment.

- Non-M&O/M&I-generated STI deliverables are increasingly provided to OSTI in appropriate electronic formats (i.e., increasing numbers of contracts are changed to require electronic formats).

- M&O/M&I contractor announcement records and full-text STI documents are increasingly made available to OSTI in agreed-upon electronic formats.

Objective 3: STI policies and procedures are collaboratively developed.

- STI points of contact actively participate in scheduled and ad hoc teleconferences, semi-annual meetings, topical meetings, and STIP Goal Team activities to determine STI procedures based on best business practices.

- Leadership and innovation are demonstrated by STI POC both locally and DOE-wide.

Objective 4: STI performance objectives are implemented with performing R&D contractors.

- Performance expectations based on adopted performance objectives are negotiated with each performing R&D contractor.

- Periodic reviews of performing R&D contractor self assessments are conducted and operational awareness of each one is maintained.

- Provide assistance and data to contracting officers on status of direct-procurement type technical information policies and deliverables.

The contribution of the overall STIP activities to meeting Departmental goals and objectives, such as those mentioned in the DOE Strategic Plan and individual program plans, is also an important assessment.

6.2 Program Reviews

In evaluating the quality of the science and technology performed by the laboratory and its relevance to their programmatic goals, DOE program managers may periodically review the programs they fund. One aspect of the effectiveness and efficiency of research program management is the effectiveness with which technical results are communicated to maximize the value of the research results and to gain appropriate recognition for DOE and the laboratory. Therefore, Headquarters programs that fund activities resulting in STI may want to consider criteria such as the following in their program reviews:

a. Effectiveness of making STI results available to maximize value of the research. (Are useful STI products or identified technical reporting deliverables made available to OSTI so that DOE reporting and public release can be completed as appropriate? What other means are used to announce the STI?)

b. Implementation of electronic reporting and access as a Departmental initiative. (Are researchers beginning to use electronic reporting? Are laboratories and other major facilities modifying their information infrastructure, such as hosting more full-text STI documents on Web sites?)

c. Incorporation of STI into projects and plans. (Is STI recognized as a key outcome of R&D that is planned for during the activity? Are activities coordinated with STI counterparts?)

7. INFORMATION SYSTEMS AND DATABASES

Several information systems or databases operated and maintained by OSTI provide information to assist in various aspects of managing the Department's STI. Some of the tools helpful in managing and providing access are described below:

a. EnergyFiles. EnergyFiles, the Virtual Library of Energy, Science and Technology (http://www.osti.gov/EnergyFiles), provides the umbrella for the other Web-based OSTI and STIP community information systems. This ever-expanding virtual collection of information sources, tools, and technologies supports the finding and use of energy-related information and the conduct of energy research. EnergyFiles serves as a central locator for various DOE and laboratory resources. It includes subject pathways comparable to technical literature subject areas of interest to DOE and end-users. A key feature of Energy Files, EnergyPortal Search, is a search engine with the capability to return distributed full text. EnergyPortal Search employs a single search strategy to search across approximately 500 heterogeneous databases and Web sites, including OSTI-developed products, that are linked through EnergyFiles.

b. DOE Energy Link or "E-Link" (http://www.osti.gov/elink) is the OSTI-developed system that facilitates electronic announcement and/or submission of DOE STI. E-Link enables DOE sites to enter data for the DOE announcement record via a Web interface or to upload data files, as well as to upload the associated full-text STI products as needed. Sites may also use E-Link to review the status of records or to revise previously submitted information. Password-protected

access is granted to DOE or DOE contractors routinely submitting records to OSTI. For more information, consult the E-Link Web site.

c. DOE Information Bridge (http://www.osti.gov/bridge) is the Web-based collection of DOE's full-text technical reports provided by STIP partners throughout the DOE complex. It can be used to access, locate, search, and download full text and/or bibliographic information electronically. Public access is provided through an agreement between DOE and the Government Printing Office (GPO), located on the GPO Access system. A DOE version, which also includes bibliographic citations (full text when available) of energy-related scientific and technical information obtained from a variety of domestic and international sources, is available to DOE and DOE contractors who obtain access from OSTI.

d. R&D Project Summaries Web Database (http://www.osti.gov/rnd/dbhome.html) contains the publicly accessible subset of the Department's research projects beginning in FY 1995. Over 75 percent of the total Department's R&D project summaries are available through this Web-based application.

e. R&D Tracking System (http://www.osti.gov/rd/) provides DOE a centrally managed database of project summaries of active R&D projects. It contains summaries collected annually starting in FY 1995, with a cumulative total of over 18,000 projects performed by the national laboratories and other DOE facilities. The system is sponsored by the Office of the Chief Financial Officer and is maintained and operated by OSTI. Access to the system is provided to authorized DOE and DOE contractor representatives.

f. PubSCIENCE (http://pubsci.osti.gov) provides access to peer-reviewed scientific and technical journal literature with a primary focus on physical sciences and other disciplines of concern to DOE. The PubSCIENCE system enables searching across thousands of bibliographic citations from multiple journal sources with direct links to the publisher's doorstep. The user can then view the full-text, if the publisher has made it available, or with a subscription, with a site license, or by pay-per-view.

g. Research and Development (R&D) Accomplishments Database (http://www.osti.gov/accomplishments) is a publicly available central forum for information about the outcome of past DOE R&D that had significant economic impact, improved people's lives, or was a significant advance in science. The core of the database consists of searchable bibliographic citations and full text of documents reporting accomplishments from DOE and DOE contractors.

h. EDBWeb (http://www.osti.gov/edbweb/) is DOE's Web version of the Energy Science and Technology Database (EDB), a compendium of over 3.8 million bibliographic citations to energy and energy-related scientific and technical information (STI) dating from 1974. Consistent with OSTI's objective to provide the DOE research community better, faster, and cheaper access to the Department's scientific and technical information, EDBWeb is made available to DOE and its contractors without charge.

i. Classified Energy Online (CLEO) contains bibliographic records (metadata) for the Department's central collection of classified DOE and other technical reports. Contact OSTI for more information about this database and related information resources.

j. Controlled Access File (CAF) contains bibliographic records (metadata) for the Department's central collection of DOE unclassified sensitive or other restricted access technical reports. Contact OSTI for more information about this database and related information resources.

PART II

ANNOUNCEMENT AND DISSEMINATION OF SCIENTIFIC AND TECHNICAL INFORMATION PRODUCTS

1. INTRODUCTION

This part of the Guide describes the procedures for accomplishing the broadest possible availability through appropriate review, access determination, and central announcement. It also defines STI products, electronic full-text formats and transfer procedures, announcement record submission, and some other activities carried out by DOE and DOE contractor elements as well as those carried out by OSTI. General information is provided on the agreed-upon STIP practices and procedures, but the Guide does not attempt to provide all details necessary for the complete life-cycle management of STI. If further information is needed, contact OSTI or consult with the STI Program contact at the respective site or organization (http://www.doe.gov/stip/pgrmcnt.htm). A central locator to DOE's publicly available STI is maintained by OSTI through the DOE Information Bridge. Additionally, OSTI fulfills Departmental mandates for broad public dissemination by administering various agreements with intermediaries for public access, including the National Technical Information Service (NTIS), GPO, and international exchanges.

NOTE: Much of the information in this Guide describes practices for management, announcement, and dissemination of unclassified and unlimited STI. Additionally, exceptions are noted where applicable for practices related to unclassified sensitive, export controlled, classified, and declassified STI. References are also provided to other DOE Orders, Manuals, Guides, and other specific guidance on the management of unclassified sensitive, classified, declassified, and export controlled STI. Users of this Guide should always refer to these specific references when determining the most up-to-date and appropriate treatment of unclassified sensitive, classified, declassified, and export controlled STI. For specific references, see Attachments 2 and 4.

2. RESPONSIBILITIES RELATED TO STI PRODUCED BY NON-MANAGEMENT, -OPERATION, AND -INTEGRATION CONTRACTORS AND FINANCIAL ASSISTANCE RECIPIENTS

This section provides information regarding non-M&O/M&I contractors and financial assistance pre-award responsibilities, awardee responsibilities, contract administration, and contract closeout procedures. DOE regulations and other guidance related to the requirement for technical information deliverables to be generated as a result of DOE-funded R&D activities and made available to OSTI are contained in DOE O 241.1A, 10 CFR 600, and 48 CFR 935.010. Additional guidance is provided throughout this Guide and by the funding program manager regarding required types of reports and the reporting frequency, as indicated in the requirements set forth in the "Federal Assistance Reporting Checklist," DOE F 4600.2, and the "Reporting Requirements Checklist," DOE F 1332.1.

Effective 10-1-00, the new DOE F 241.3, "Announcement of Department of Energy (DOE) Non-M&O/M&I Scientific and Technical Information (STI)," will be available for non-M&O/M&I contractors and financial assistance recipients to use. This form should be used by the non-M&O/M&I contractors and financial assistance recipients in lieu of DOE F 241.1, "Announcement of U.S. Department of Energy Scientific and Technical Information (STI)." Additional information related to DOE F 241.3 is available throughout this section of the Guide.

Effective 10-1-00, non-M&O/M&I contractors and financial assistance recipients will begin using the new DOE F 241.3, "Announcement of Department of Energy (DOE) Non-M&O/M&I Scientific and Technical Information (STI)," designed specifically for their use. This form should be used by the non-M&O/M&I contractors and financial assistance recipients in lieu of the DOE F 241.1. Additional information related to the DOE F 241.3 is available throughout this section of the Guide.

2.1 Preaward Responsibilities

The initiator of the procurement request specifies the type, frequency, and content of any scientific and technical reports/products required under the award. The contracting officer is to ensure that these reporting requirements and performance objectives and measures, if any, are included in the solicitation and/or resulting award.

Beginning in December 2000, DOE will request non-M&O/M&I contractors and financial assistance recipients of new awards to submit their scientific and technical reports in the Adobe Acrobat Portable Document Format (PDF) via the Internet. Electronic reports submitted in a format other than PDF will be returned and the report considered delinquent. Standardized contract language should be adopted to relate this electronic requirement to new awardees.

2.2 Awardee Responsibilities

The non-M&O/M&I contractors and financial assistance recipients should submit to DOE required technical/scientific reporting deliverables resulting from R&D-funded work as specified by the "Federal Assistance Reporting Checklist" (DOE F 4600.2) and the "Reporting Requirements Checklist" (DOE F 1332.1) under "Technical Information Reporting." Information on the recommended attributes of STI products is included in Part II, Section 5, of this document.

Each scientific and technical report/product should be accompanied by a completed electronic version of DOE F 241.3. This form and instructions are available on E-Link (http://www.osti.gov/elink). The form is also available on DOE's Forms Internet site at http://www.explorer.doe.gov:1776/htmls/doeforms.html. E-Link validation ensures that all required fields are completed. Any incomplete or inaccurate form, and its accompanying report, will be returned and the report considered delinquent. DOE F 241.3 is required only for scientific and technical reports/products. It is not required for management and progress reports, lists of published literature citations or presentations, memoranda, or other non-technical information that should not be submitted to OSTI. Part II, Section 4, of this Guide provides a complete list of what is appropriate to submit to OSTI for announcement.

Electronic reports must be submitted as integrated PDF files that contain all text, tables, diagrams, photographs, schematic, graphs, and charts. However, materials, such as prints and videos, that are essential to a report but cannot be submitted electronically should be sent directly to the contracting officer. E-Link provides more details about converting a file to PDF. Electronic reports submitted in a format other than PDF will be returned and the report considered delinquent.

Non-M&O/M&I contractor or financial assistance recipients who cannot access E-Link must submit technical and scientific reports/products to the contracting officer on a diskette or CD-ROM. The diskette or CD-ROM should include the scientific and technical report/product in an integrated PDF file and the accompanying DOE F 241.3 and be labeled as follows:

- DOE Award Number
- Type of report(s)
- Reporting Period
- Name of submitting organization
- Name, phone number, and fax number of preparer

Diskettes should be 3.5-in., double-sided, high-density (1.4 M Byte capacity). If file compression software is used to transmit a PDF file spanning more than one diskette, PKZIP from PKWare, Inc., is the compression software that should be used. Label the diskettes by their sequence number and the number of diskettes in the set (e.g., "1 of 3").

If an award's reporting requirements include DOE F 241.2, "Notice of Energy RD&D Project," the non-M&O/M&I contractor or financial assistance recipient should submit the form directly to OSTI, with a copy to the contracting officer. This research, development, and demonstration (RD&D) form is available for electronic submission at https://secure.osti.gov/rd/owa/rd_doe_contract.input_page. An optional PDF fillable form is accessible at http://www.osti.gov/elink/. The PDF fillable form can be completed online, printed, and mailed to OSTI. OSTI will process the "Notice of Energy RD&D" form for inclusion in the Department's R&D Tracking System, maintained and operated by OSTI for the Office of the Chief Financial Officer.

2.3 Contract Administrative Responsibilities

Contracting officers and contracting officer technical representatives are responsible for ensuring that the receipt of required interim and final technical/scientific reporting deliverables as defined in DOE F 4600.2 and DOE F 1332.1, are monitored and provided to OSTI.

DOE STI releasing officials will be provided access to E-Link to ensure appropriate review of the DOE F 241.3 data and the accompanying report file. Prior to releasing the DOE F 241.3 and corresponding deliverable, the respective DOE operations office STI releasing official is responsible for ensuring appropriate review of the announcement data and the accompanying report file for restrictions on the announcement and availability of the full text information. Their review will include the identification of any restrictions on the announcement and availability of the full text information;

correction of previously submitted records, if necessary; and the release of reports to OSTI. Considerations for the review process to release STI products for announcement are referenced in Part II, Section 3 of this Guide.

2.4 Contract Closeout Responsibilities

Contracting officers are to ensure that technical/scientific reporting deliverables are received by the Department prior to closing the award. Confirmation is provided by OSTI, which obtains the information concerning the expected STI deliverables from the awarding office's Procurement and Assistance Data System (PADS) data entry; OSTI also monitors the receipt of the specified deliverables through an OSTI database. Additionally, other select operations office staff will have access to the database to review information pertaining to deliverables received by OSTI. The database may be queried to determine the status of technical/scientific reporting and to identify any overdue technical/scientific deliverables. The OSTI database will also provide a link to the full text of STI products previously submitted (if submitted electronically).

Final performance reports for financial assistance reporting are due by regulation 90 calendar days after the expiration or termination of the award [see 10 CFR 600.151 (b) and 600.240 (b)]. Contract deliverables are due in accordance with the date stated in the contract. Accordingly, a report is considered delinquent if it is not submitted by the date shown in the contract. All technical/scientific reporting deliverables are due no later than the expiration of the contract.

Because scientific and technical information deliverables from non-M&O/M&I contracts and financial assistance agreements represent a return to the Department and taxpayer, the practice of waiving the receipt of deliverables is discouraged. However, the contracting officer may determine that a waiver is in the best interest of the Government after reasonable efforts to obtain the deliverables have been exhausted. The contracting officer should document the reason for the waiver and maintain it as part of the official contract file.

3. APPROPRIATE REVIEW PROCESS TO RELEASE STI PRODUCTS FOR ANNOUNCEMENT

Each site originating STI determines which reviews are appropriate for that site in accordance with funding agency policies; Departmental guidelines; and other applicable statutes, laws, and regulations. The DOE Information Security Program (DOE O 471.2A) requires owners of data to determine the sensitivity of information before it is used, processed, or stored on information systems. (See Attachment 2 for additional statutes that relate to STI.) STI products should be reviewed for restrictions on both the announcement and availability of the full-text information. Section 4 describes criteria to consider when determining the submission of STI products to OSTI. DOE operations offices' STI products are reviewed appropriately according to DOE O 241.1A. Reviews to be performed by the site to determine announcement and availability of STP products, or restrictions thereto, may include, but are not limited to, the following:

- classification/declassification,

- copyrighted materials or other intellectual property,
- export controls or distribution restrictions, and
- sensitive content, such as Unclassified Controlled Nuclear Information or subject-specific limitation that limits access. (See descriptions in Attachment 4).

4. STI PRODUCTS APPROPRIATE FOR ANNOUNCEMENT

DOE and its contractors determine which STI products are announced to OSTI based on the criteria outlined in Section 4.1 and provide announcement and availability instructions to OSTI through the metadata elements contained in the announcement record. Any limitations dictated by content or contract and collaborative agreement terms restrict the announcement and availability to the appropriate audience and prescribe what method the sites will use to report the product to OSTI.

4.1 STI Products

Any STI product is appropriate for announcement to OSTI that (1) is considered useful to others outside the originating organization, (2) is a contract deliverable, or (3) includes findings, statistics, or analysis related to research and development. The originator of the product may be DOE or a DOE-funded contractor or grantee. The completeness, accuracy, and quality of such products are ensured by the originating site prior to announcement to OSTI.

Typical STI products produced by DOE or its contractors that are sent or announced to OSTI include the following (see Attachment 3 for definitions):

- all non-M&O/M&I generated technical/ scientific reporting deliverables
- commercially published books (an announcement record only may be submitted if copyright restrictions are imposed on product)
- conference papers
- conference proceedings
- cooperative research and development agreement (CRADA) deliverables
- environmental impact statements (product may be provided to OSTI if not being provided to DOE's Center for Environmental Management Information (CEMI); if full-text document is provided to CEMI, an announcement record submitted to OSTI would show CEMI as the availability)
- laboratory-directed R&D (LDRD) STI deliverables
- journal article preprints and postprints (an announcement record only may be submitted if copyright restrictions apply, e.g., for reprints)
- noncommercially published books
- patent applications
- software
- scientific and technical (S&T) accomplishment reports
- technical reports (topical, progress, final, etc.)
- theses/dissertations
- translations
- Work for Others (WFO) deliverables (unless excluded in WFO agreement)

The following other information products are also submitted to OSTI for central processing and announcement at the direction of Headquarters program offices. These do not follow the STI product submission process and do not require an announcement record (DOE F 241.1):

- foreign trip reports,
- OpenNet documents
- R&D project summaries.

Products that may contain some STI but are not submitted to OSTI for announcement and availability, regardless of medium, include the following:

- administrative materials
- brochures
- catalogs
- correspondence
- databases
- draft documents
- empirical data
- engineering drawings
- field work proposals
- financial information
- future conferences
- notices
- memoranda
- monthly reports
- newsletters
- policies
- procedures
- proposals/predecisional information
- public communications (except S&T accomplishments)
- report sections (when full report is STI)
- weekly reports
- WWW Pages (except those applicable as a URL for an STI product)
- non-technical programmatic publications (e.g., strategic plans)

An STI product can be in one or more media, including–

- audiocassettes
- compact disks
- diskettes
- film
- magnetic cartridges
- magnetic tapes
- microform
- paper
- videocassettes
- videodiscs
- Web-based files

4.2 Announcement/Availability Categories for STI Products

STI products are announced and made available based on contractor or DOE review. (See Part II, Section 3.) When the announcement record for the STI product is submitted to OSTI, it identifies the appropriate announcement category. The definitions of the specific notices and restrictive legends and any special procedures are listed in Attachment 4. The six announcement and availability categories are shown in Table 1.

5. THE CONTENT OF STI PRODUCTS

5.1 Introduction

This section contains information on the recommended attributes of STI products. Additional details are available in *Scientific and Technical Reports Elements, Organization, and Design* [American National Standards Institute/National Information Standards Organization (ANSI/NISO) Z39.18-1995].

Table 1. Announcement/Availability Categories for STI Products.

Category	Where OSTI Announces or Makes Product Available
Unclassified Unlimited Information (publicly releasable)	DOE Information Bridge (DOE and Public versions), EnergyFiles, NTIS, GPO, Energy Technology Data Exchange (ETDE), and other U.S. and international outlets
Unclassified Sensitive or Other Protectable Information: • Official Use Only information • Program-Directed Special Handling (e.g., applied technology) • Proprietary Data/Trade Secrets • Protected Data (e.g., CRADA) • Small Business Innovation Research (SBIR) • Small Business Technology Transfer Research (STTR) • Copyrighted Material	Controlled Access File, Special Program-Sponsored Databases with Access Limitations DOE-only Information Bridge
Unclassified Controlled Nuclear Information (UCNI)	Classified Energy Online (CLEO)
Export Controlled Information	Controlled Access File, Special Program-Sponsored Databases with Access Limitations
Classified Information	Classified Energy Online (CLEO)
Declassified Publicly Releasable Documents	OpenNet

Information on classifying and declassifying documents and materials is located in DOE M 475.1-1, IDENTIFYING CLASSIFIED INFORMATION. This Manual also specifies an organizational requirement to submit bibliographic information and availability information to OSTI for every document that is declassified and determined to be publicly releasable.

5.2 Recommended Attributes of STI Products

Recommended attributes of STI products, and their traditional location in paper-based, stand-alone technical reports, are shown in Table 2. Attachment 5 shows a typical published technical report cover and title page.

Table 2. Recommended Attributes of STI Products.

Attributes	Typical Placement on STI Product
Abstract	First text page
Author	Cover or title page, or first page of text
Award/Contract/Financial Number	Cover, inside front cover, title page
Date	Cover or title page
Disclaimer	Inside front or back cover
Distribution Statement	Cover or title page (Statement A can be placed on inside front cover)
Funding Offices	Cover, inside front cover, title page
Performing Organization	Cover, title page, outside back cover
Report/Product Number	Cover, title page or outside back cover
Report Type	Included in title on cover or title page and first page of text
Reporting Period (period of coverage)	Included in title on cover or title page and first page of text
Title	Cover or title page and first page of text
Classification Level and Category (if applicable)	Refer to DOE M 471.2-1A, CLASSIFIED MATTER PROTECTION AND CONTROL MANUAL
Caveats (Special Markings) (if applicable)	Refer to DOE M 471.2-1A

5.2.1 Abstract

An abstract is a concise statement of the purpose, scope, and major findings of the information product. The abstract is intended to be stand-alone text, independent of the full product, and is written appropriately for wide dissemination. The abstract is especially important in nonprint information products. For more information, see *Guidelines for Abstracts* (ANSI/NISO Z39.14-1997).

5.2.2 Author

Author(s) and their employers are typically identified on the information product. Editors and compilers also may be identified.

5.2.3 Award/Contract/Financial Number

Any of the following numbers that apply are usually included on the cover/title page: DOE award or contract number(s), Budget and Reporting number (B&R), unique project identifier, or technical plan number under which the work was funded.

5.2.4 Date

A publication or issuance date and the basis for it are recommended to be provided on the information product. Examples of dates are shown in Table 3.

Table 3. Publication or Issuance Date.

Type of Date	Sample Text
Date published	August 4, 1998 July 1998
Manuscript date	June 13, 1998
Date compiled	January - March 1998

5.2.5 Legal Disclaimer

In accordance with Federal law and the guidance of appropriate legal counsel, disclaimer(s) are to be included where appropriate. See Attachment 6 for typical disclaimer statements.

5.2.6 Distribution Statement

A distribution statement may be required on some STI products. Unclassified STI products with sensitive/limited content require special, unique controls in conformance with applicable statutes, laws, regulations, Executive orders, international agreements, directives, and Departmental policy. Such markings are to be consistent with the access limitations indicated on DOE F 241.1 or DOE F 241.3. The appropriate notices, restrictive legends, distribution statements, and restrictive markings are provided in Attachments 4 and 7.

5.2.7 Funding Office

The funding office(s) or sponsoring organization(s) may be identified by name, symbol/logo, or B&R code of the Department office providing the support or funding.

5.2.8 Performing Organization

The name and address of the performing or research organization and/or site of origin are typically identified. Subcontract work is normally submitted through the performing R&D contractor or laboratory.

5.2.9 STI Product/Report Number

To assist in retrievability, it is recommended that every product published by the origination organization be assigned a standard product/report number that contains some unique identifier that can be traced to the site of origin. The report number formats typically used within the Department are based on the *American National Standards Institute Standard Technical Report Number (STRN) Format and Creation* (ANSI/NISO Z39.23-1997). Examples are shown in Table 4.

Special numbering may be used for a report series or sequence and translations. Existing series or numbering guidelines used within the Department are available from OSTI.

Table 4. Standard Report Number.

Description	Standard Report Prefix
DOE Program Office	DOE/XX– nnn, where XX is 2-letter office code, followed by numerical sequence
DOE Field Element	DOE/ZZ– nnn, where ZZ is 2-letter field code, followed by numerical sequence
Major Project Office	DOE/XX– nnn, where XX is 2- or 3-letter office code, followed by numerical sequence
National Energy Technology Laboratory	Example: DOE/NETL– nn/nnnn
Major Labs/Contractors	Most laboratories have approved report series prefixes; e.g., ANL/TN– nnn. May also use DOE/XXX– nnn, where XXX represents approved site codes.
Other Contractors	DOE/XX/nnnnn– where letters and numbers are extracted from contract number.

Additional information may be added to the product number, such as the following types of suffixes:

Table 5. Additional Identifying Information.

Description	Standard Suffix
Abstract	Abs.
Addendum	Add.
Edition	Ed.
Executive Summary	Ex. Summ
Part	Pt.
Revision	Rev.
Supplement	Suppl.
Volume	Vol.

For multimedia products, it is recommended that the characters in Table 6 be used at the end of the number to indicate the medium.

Table 6. Multimedia Identifiers.

Description	Standard Suffix
Audiocassette	AC
CD ROM	CD
Diskette	DK
16-millimeter film	FM
Magnetic cartridge	MC
Magnetic tape	MT
Slide	SL
Videocassette	VC
Videodisc	VD
Viewgraph	VG

5.2.10 Title

A brief title is recommended that describes the subject matter covered. A subtitle may be used for further clarification. Additional guidelines are provided below:

- When an STI product has more than one volume, repeat the primary title on each volume. Use a subtitle to identify the specific subject of the individual volume.

- If the report is other than topical, provide the report type and the period covered, if appropriate, as part of the title or subtitle. For non-M&O/M&I generated reports, the report type and period covered are critical for acknowledging receipt of specified deliverables.

- Except for extraordinary circumstances, unclassified titles are to be used for classified documents. Titles must be marked with the appropriate classification level, category, and any caveats, as applicable (see DOE M 471.2-1B).

5.3 Miscellaneous Information

5.3.1 Company Names and Logos

In accordance with the Joint Committee on Printing's Government Printing and Binding Regulations, S. Pub 101-9, Title III, Paragraph 13, company names, logos, and similar material may not appear on the internal text pages of Federal publications or on photographs therein.

5.3.2 Measurement System

Use of the metric system for all units of measure in scientific and technical products is recommended on the basis of direction contained in Executive Order 12770, "Metric Usage in Federal Government Programs," dated 7-25-91; the Metric Conversion Act of 1975 (Public Law 94-168, as amended by Public Law 100-418); and various Title 15, Code of Federal Regulations parts and subparts, use of the metric system for all units of measure in scientific and technical products is recommended. (English may be included in parentheses after the metric unit if necessary.)

5.3.3 Reproduction

Reproduction of information must comply with the Joint Committee on Printing's Government Printing and Binding Regulations, and with DOE directives.

5.3.4 Report Documentation Page

The report documentation page, used by some Federal agencies in announcing and cataloging reports, is not used by DOE; the DOE announcement record contains similar information. DOE laboratories and facilities that conduct work for others may need to obtain the report documentation page (Standard Form 298) from the agency sponsoring the work.

5.3.5 Copyrighted Material

Items produced by U.S. Government employees as part of their official duties cannot be copyrighted (17 U.S.C. 105). If an item produced by one or more Government employees is copyrighted as part

of a larger work, and the fact of Government employment is not noted in the STI product, a notice affirming the status of the author(s) as Government employee(s) must accompany the product.

If the U.S. Government has been granted authority to reproduce, sell, distribute, or otherwise make the STI product available by virtue of contract language or otherwise, the following statement must appear on the cover or title page:

> *The U.S. Government is authorized to reproduce, sell, distribute, or otherwise make available this copyrighted work. Permission for exercise by the recipient of any of the exclusive rights mentioned in 17 U.S.C. 106 must be obtained from the copyright owner.*

A translation of a copyrighted work is itself a derivative work, and permission from the copyright owner of the original work must be secured before the translation is performed and the translation sent to OSTI. Translations made from text published in a country signatory to the Geneva Copyright Convention must contain one of the following signed statements:

> *The U.S. Government has been authorized to reproduce, distribute, and sell this copyrighted work. Permission for further reproduction or distribution must be obtained from the copyright owner.*

or

> *The original text is not copyrighted.*

Most copyright restrictions, however, pertain to the use of third-party copyrighted material incorporated within a DOE-sponsored STI product. If the STI product, or parts thereof, is copyrighted, a letter obtained by the STI product originator and signed by the copyright owner or authorized representative is to be maintained by the originating site. The letter must state the scope of the release or permission to reproduce, distribute, prepare derivative works, display, or perform publicly so that access and availability can be accurately provided in the announcement record (DOE F 241.1 or DOE F 241.3) for STI products made available to OSTI.

Announcement and dissemination of the STI product will be based on DOE F 241.1 data (see also Section 4.2).

5.3.5.1 Guidance Relative to M&O-Type Contracts

In general, M&O-type contracts provide for Government ownership and unlimited rights in the Government for all technical data first produced in the performance of the contract. One exception to the Government's unlimited rights is data in which the contractor has asserted copyright.

For scientific and technical articles submitted to and published in journals, symposia, proceedings, or similar works, the contractor can assert copyright without prior permission of DOE, but the Government is granted a nonexclusive, paid-up, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government (broad license). As specified in the M&O contract, when copyright is

claimed and the article is submitted for publication, the contractor should affix the appropriate copyright notice reflecting the Government's rights. For DOE purposes of disseminating R&D results, it is preferable for the originator's manuscript (unpublished form of the full text) to be provided to OSTI, rather than submitting copyrighted journal reprints that may have copyright restrictions.

For all other technical data first produced in the performance of the contract, such as in technical reports, permission from DOE is required to establish and claim copyright. If permission is granted, a notice is to be included acknowledging the Government's license. For items granted copyright, DOE F 241.1 should be marked "copyrighted" with any restrictions specifically noted. If permission to establish or claim copyright has not been requested or granted, no copyright marking is warranted and the document will have unlimited distribution.

For graduate theses in which DOE has sponsored the work, such as those provided to OSTI by DOE laboratories, DOE retains the right to use the scientific and technical information, similar to guidance stated above. The author's copyright notice may be applied to the document, but it does not limit DOE's use of the information. Therefore, DOE F 241.1 is to be marked "copyrighted" with "no" restrictions.

Most contractors have standard procedures that their researchers are not to include third-party copyrighted material within their STI products. If such material is included (such as a chart or illustration), release is to be obtained prior to publication of the STI product. This release is to be shown on DOE F 241.1 by indicating "copyrighted material" with "no" restrictions. If the publisher permits use with restrictions, DOE F 241.1 should indicate "copyrighted" with "yes" marked and the type of restriction specified (e.g., "distribute full text upon request only"; "limit distribution to DOE"; "refer requests to publisher"; etc.).

For translations, as noted above, if warranted, permission should be obtained before preparing the translation and such permission stated in the translation. In addition, if permission is granted and DOE funds the translation, DOE retains the right to use the translation similar to other works as described above. Thus, if no marking appears on the translation, no copyright restrictions are assumed. If copyrighted, the work may still be used for DOE and DOE contractors, as described above for other STI products.

See Part III, Section 4.3.1, for guidance relating to copyrighted software.

5.3.5.2 Guidance Relative to Financial Assistance Recipients

DOE adds a full data clause to all R&D grants relative to protecting Government-funded data, resulting in either unlimited rights or broad government license in data delivered to DOE. Procurement offices work with their respective patent counsels on specific language.

The following statement, which is specific to copyright, appears in 10 CFR 600.27, paragraph (b) (2) (c):

> The recipient grants to the Government a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use the work for Federal purposes, and to authorize others to do so. The right to publish includes the right to publicly distribute. The right to use the work for Federal purposes includes the right to prepare derivative works.

The following statement, which is specific to intangible property, appears in 10 CFR 600.136, paragraph (1):

> The recipient may copyright any work that is subject to copyright and was developed, or for which ownership was purchased, under an award. DOE reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish or otherwise use the work for Federal purposes, and to authorize others to do so.

5.3.6 Digitized Signatures

An image of a hand-written signature may appear within an electronic information product as part of the content of the original product. However, inclusion of the signature may pose a risk when products become digitized for electronic dissemination on the Internet. The actual signature is not a required element for submittal of an STI product for announcement and availability. Therefore, it is recommended that those who transmit STI products to OSTI consider the potential risk, if any, of providing an image of the hand-written signature either through submission of an electronic version of the STI product to OSTI or for OSTI scanning procedures to create an electronic format.

6. MAKING SCIENTIFIC AND TECHNICAL INFORMATION AVAILABLE

To centrally announce the availability of DOE's STI products, each DOE and DOE contractor element that originates an STI product is required by DOE O 241.1A to provide an announcement record (e.g., DOE F 241.1 or DOE F 241.3) to OSTI. The preference is electronic submission to OSTI, which will process the record and announce the product's availability to the appropriate audience (DOE, other Government agencies, the public, etc.).

Unclassified, unlimited STI products will be announced in the DOE Information Bridge. Anticipated processing times vary depending on the medium of both the STI product and the DOE F 241.1 or DOE F 241.3 announcement record.

Electronic records with electronic STI products require the least amount of processing time, currently about two work days. Paper forms and paper STI products require the maximum amount of processing, approximately 25 days. Receipt of incomplete and/or inconsistent data lengthens the processing time further.

The DOE STI processing system, called DOE Energy Link or "E-Link", is available for electronic transmittal of announcement records and full-text STI products. See http://www.osti.gov/elink for more information.

6.1 Announcement Record

In FY 1997, the Department of Energy and contractor STIP partners adopted the Dublin Core metadata elements as the basis for creating the metadata-based announcement record DOE F 241.1, which replaces DOE F 1332.15. In FY 2000, the announcement record DOE F 241.3 was developed for use by non-M&O/M&I contractors and financial assistance recipients.

The metadata-based announcement record generated and supplied by DOE and DOE contractors for STI products includes the basic Dublin Core metadata elements, supplemented by a few DOE data elements, and a minimal number of sub-elements necessary to further identify the announcement/availability of the STI product (see Section 6.1.1).

The announcement record is for all STI products; however, for software, the announcement record form varies slightly (see Part III). Electronic submission of the announcement record to OSTI is preferred. However, for Unclassified Sensitive Information, Classified, and Declassified STI products, the announcement record must contain only unclassified, unlimited data if it is transmitted over open system networks. Likewise, an STI product determined to be unclassified/sensitive, export controlled, or classified itself must not be transmitted over open system networks (see Part II, Section 6.4). This determination is noted by the originating site's releasing official, who indicates on DOE F 241.1 or DOE F 241.3 the authorized announcement of STI products. Each site has an STI point of contact who may serve as or designate others to serve as releasing official(s).

6.1.1 List of Metadata Elements

Table 7 lists the metadata and other data elements contained in the announcement record, with descriptions and indications for required (R) and optional (O) fields. Subelements are noted in italics. Note that most of these elements will appear in databases/systems accessible to many users; thus, the primary bibliographic information should be appropriate for public release (i.e., the title and abstract should not contain sensitive information).

6.1.2 Forms Available

Paper versions of announcement record forms DOE F 241.1, DOE F 241.3, and DOE F 241.4 are located in the attachment section of this document. DOE F 241.1 may also be sent electronically in two ways: a Web-based form or tagged document instance (based on a document type definition (DTD) as a means of tagging the data elements to identify the content of the announcement record). DOE F 241.3 can be sent electronically using a Web-based form. Additional information is available at http://www.osti.gov/elink.

6.1.2.1 Web Form

Web-based versions of the DOE announcement record input forms, based on HTML, are available at http://www.osti.gov/elink. The Web input forms provide a number of features, such as distinguishing mandatory from optional fields, choosing from pick-lists of values, and indicating appropriate subelements. Certain data elements and subelements are then checked and must be

Table 7. DOE STI Metadata Elements.

DOE F 241.1	DOE F 241.3	Metadata Element	Description
R	R	Author(s)	Unlimited number is acceptable; the primary author should be listed first. Allows for "NONE" as an option for few cases where necessary.
O	*O*	*E-mail Address(es)*	*Provide in same order as author names. Will not be available to the end-user. This data is used by OSTI to automate author notification.*
O	O	Contact	Site contact (other than authors), as determined appropriate by the site, who will receive any external questions about the content of the STI product. Will be included in the published announcement record.
R		Date of Publication	Identifies the publication or issuance date. Standard format mm/dd/yyyy to be followed, but requires at least a standard 4-digit year and 2-digit month. If day is "00", default value will be "01" for certain DOE output products where a full date is required.
O	O	Description/ Abstract	Defined as the abstract for technical reports. Provide if available. Text should be spell-checked, limited in length to 5000 characters, and follow input standards for special characters.
N/A	R	DOE Releasing Official	DOE operations office's designated official(s) who ensure that all appropriate sensitivity and export control reviews are completed of the STI product (Patent, UCNI, ECI, copyright, etc.).
R	R *N/A*	*Intellectual Property/ Distribution Limitation* *- Unlimited* *- OpenNet* *- U.S. Dissemination Only* *- Copyrighted Material* *- Limited Rights Data*	*One selection is required. Nonconflicting multiples are allowed. Includes minimum supporting fields (e.g., release dates).*

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
		Intellectual Property/ Distribution Limitation (continued)	
N/A		*- Patentable Material*	
		- Protected Data	
N/A		*- SBIR*	
N/A		*- STTR*	
		- OUO	*Non-M&O/M&I recipients/contractors refer to Other Special Access on the DOE F 241.3.*
		- Program-Directed Special Handling	*Non-M&O/M&I recipients/contractors refer to Other Special Access on the DOE F 241.3.*
		- Export Controlled Information (ECI)	
		- Unclassified Controlled Nuclear Information (UCNI)	*Non-M&O/M&I recipients/contractors refer to Classified/Controlled Information on the DOE F 241.3.*
		- Classified	*Non-M&O/M&I recipients/contractors refer to Classified/Controlled Information on the DOE F 241.3.*
		- Other Exceptional Information	*Non-M&O/M&I recipients/contractors refer to Other Special Access on the DOE F 241.3.*
O	N/A	Language (non-English)	Include if language of the STI product is not English.
O	O	Location/Transmission Information (aka Transmission Information for DOE F 241.1)	
O	*O*	*Unique STI Product URL*	*Include if STI product is Web-posted. Refer to Media/Format on the DOE F 241.1.*
O	*O*	*STI Product is being transmitted to OSTI*	*Indicates method used to transmit STI product to OSTI.*

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
		Location/Transmission Information *(continued)*	
O	*O*	*Information Product File name*	*Provide if STI product is electronic and is being transmitted to OSTI. Include the appropriate format extension.*
R	N/A	Originating Research Organization(s)	The organization/site conducting the research.
		Media/Format Information	Detailed information about the media and format of the STI product.
O	*O*	*File Format*	*Provide if the STI product is electronic. Include the appropriate format extension.*
R	*R*	*Medium of STI Product*	*Identifies the medium of the item. One selection is required. Multiple selections are possible.*
O	*O*	*Size of STI Product*	*Include if applicable.*
O	*O*	*Computer medium or Audiovisual*	
O	*O*	*Quantity/type*	*Provide if STI product is Computer Medium or Audiovisual Material.*
O	*O*	*Machine Compatibility*	*Provide if STI product is Computer Medium or Audiovisual Material.*
O	*O*	*Sound*	*If applicable.*
O	*O*	*Color*	*If applicable.*
O	*O*	*Tables/Graphics*	*If applicable.*
O	*O*	*Other Information About Product Format*	*If applicable.*

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
O	N/A	Other	Include other useful information related to the STI product that is not suited for any other field (e.g., relationship of one STI product to another, etc.). Will be included in the published announcement record.
O	N/A	Publisher Name and Location	Include if different from originating research organization. The name and location of the organization/publisher that issued the document for dissemination.
O	*N/A*	*Availability (Refer Requests To)*	*Provide if applicable (e.g., if STI product is available only from originator or publisher).*
N/A	R	Recipient/Contractor	The financial assistance recipient or non-M&O/M&I contractor conducting the research.
O	O	Recipient/Contractor Point of Contact	Non-M&O/M&I recipient/contractor point of contact (other than authors); as determined appropriate by the non-M&O/M&I recipient/ contractor, who will receive any external questions about the content of the STI product. Will be included in the published announcement record.
R	R	Record Status	Identifies the announcement record or the STI product as new or revised.
R	N/A	Releasing Official	Site's designated official(s), who ensure(s) that all appropriate sensitivity and export control reviews of the STI product are completed (Patent, UCNI, ECI, copyright, etc.).
O	O	Sponsoring DOE Program Office (aka Sponsoring Organization on DOE F 241.1)	The sponsoring or funding office of the work reported in the STI product.
R	*R*	STI Product Identifiers *Report/Product Number(s)*	*The unique primary report or STI product number. Allows for "NONE" as an option for few cases where necessary.*

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
		STI Product Identifiers *(continued)*	
R	*R*	*DOE Contract Number(s)*	*Allows for "NONE" for cases where necessary.*
O	*N/A*	*R&D Project I.D.(s)*	*A unique and permanent ID assigned to identify a particular research project or funding source.*
O	*N/A*	*Work Proposal Number*	*A unique seven-character identifier assigned to a field work proposal for proposing work to a program office.*
		STI Product Identifiers *(continued)*	
O	*N/A*	*Proposal Revision Number*	*A sequential number assigned if the initial proposal is changed.*
O	*N/A*	*Work Authorization Number*	*A unique, standardized seven-character identifier assigned by the issuing organization, specific to a work authorization. Standard format is two characters identifying the issuing DOE organizational code, four-digit sequential number assigned by issuing organization, and one digit signifying last digit of fiscal year.*
O	*N/A*	*Authorization Revision Number*	*A sequential number assigned if the initial authorization is changed.*
O	*O*	*Other Identifying Number(s)*	*If appropriate, includes CRADA number, LDRD number, B&R code, etc.*
	R	STI Product Issue Date	Identifies the issuance or publication date. Standard format mm/dd/yyyy to be followed, but requires at least a standard four-digit year and two-digit month. If day is "00," default value will be "01" for certain DOE output products where a full date is required.

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
N/A	R	STI Product Reporting Period	Indicates the period of time covered (beginning and ending dates) by the STI product. Standard format mm/dd/yyyy to be followed, but requires at least a standard four-digit year and two-digit month.
N/A	*O*	STI Product Reporting Requirement Review *Deliverable completes all required deliverables for this award*	*Include if the STI product is the last deliverable completing the requirement for STI deliverables for the respective award.*
N/A	*O*	STI Product Reporting Requirement Review *(continued)* *Deliverable fulfills a technical information reporting requirement, but further dissemination should not be done*	*Indicates that the STI product is not suitable for dissemination outside of DOE based on report type or content; however, it does fulfill a technical information reporting requirement.*
R	R	STI Product Title	The title of the STI product.
R		STI Product Type	Identifies the type of STI product.
O	*O*	*Technical Report*	*Identifies the type of technical report.*
O	*O*	*Conference Information*	*Conference title, location, and date.*
O	*O*	*Software Manual*	*The manual for a specific software package. The software package should be made available simultaneously to the Energy Science and Technology Center (ESTSC) with DOE F 241.4.*
O	*O*	*Journal Information*	*Type, journal name, volume, issue, serial identifier.*

Table 7. DOE STI Metadata Elements (continued).

DOE F 241.1	DOE F 241.3	Metadata Element	Description
		STI Product Type *(continued)*	
O	*N/A*	*S&T Accomplishment Report*	*Indicates an outcome of R&D that has achieved significant impact to commerce or standard of living or recognized as a major scientific and technical advancement.*
O	*N/A*	*Book*	
O	*N/A*	*Patent Application*	*Date filed, date priority, patent assignee.*
O	*N/A*	*Thesis/Dissertation*	
N/A	*O*	*Other*	*Include other type of STI product when it is none of the specific types listed.*
O	O	Subject Categories	Identifies the subject matter of the STI product. See Attachment 8. Multiples accepted; list primary category first.
O	*O*	*Keywords*	*Sites may provide free-form keywords, multiples accepted. Keywords are not validated, but may be compared with valid thesaurus terms at OSTI.*

entered appropriately prior to submission of the forms to OSTI via validation built into the Web forms. Submission of the Web forms are managed by the originating site's designated releasing official(s), whose submission of the form is password-validated.

6.1.2.2 Tagged Document Instance (Based on DTD)

The tagged document instance is based on an SGML DTD for the DOE announcement record and is available for those sites that choose to export their data directly from an existing bibliographic database. The DTD may be obtained at http://www.osti.gov/elink. By validating data elements and subelements within the batch process before submitting the file, sites will facilitate parsing and processing of the data at OSTI.

6.2 Submission of the Announcement Record

Once an announcement record has been compiled, it may be submitted to OSTI electronically. A site may submit multiple announcement records in one electronic file submission. Methods for transmitting the announcement records or electronic file and standard media storage specifications are listed in Table 8.

Once an announcement record or file has been received, OSTI will verify acceptability of the information (i.e., verify that the file is machine-readable, that required elements are provided, and that no conflicting data are present) and complete the process of announcing/distributing the information, as well as archiving the announcement records. The originating site will receive a communication stating that the record or file has been received and is acceptable for processing. If the record or file is unusable, OSTI will notify the originator of the problem and request resubmission of the electronic record or file or use of another acceptable file format. Questions regarding specific acceptance of electronic announcement record submissions should be directed to OSTI.

Table 8. Submission of Announcement Record.

Electronic Form	Transmission Media	Additional Specifications	Category
Tagged Document Instance (based on SGML DTD)	Upload to OSTI	OSTI provides upload capability via E-link	Unclassified, unlimited form information
	Diskette	1.44-megabyte, 3.5-inch diskette (magnetic storage media)	All
	CD ROM		All
	Tape	8-mm DAT magnetic media	All
Web	Web Browser	http://www.osti.gov/html/f241-1/f241-1.html	Unclassified, unlimited form information

6.3 Acceptable Electronic Formats for Full-Text STI Products

DOE sites and facilities are transitioning to electronic exchange of full-text STI. The goal is to complete the transition by 2004. The acceptable electronic formats were adopted by the STIP community to encourage this transition.

Acceptable electronic formats are determined by the level of search capability, accessibility and file integrity, and file management capability. As technologies evolve, this list of formats will be revised and updated. The current acceptable formats accommodate a range of needs within the DOE information environment to ease the transition from a paper-based system to an electronic delivery system.

Current acceptable electronic formats are—

- Corel WordPerfect (Versions 5.0 or greater)
- Extensible Markup Language (XML)
- Hypertext Markup Language (HTML)
- Microsoft Word (Versions 5.0 or greater)
- Portable Document Format (PDF) (image)
- Portable Document Format (PDF) (normal)
- Postscript
- Standard Generalized Markup Language (SGML)
- TIFF Group 4

6.4 Submission of Full-Text STI Products to OSTI

Sites are urged to submit STI products to OSTI electronically. The table below shows the acceptable media and transmission method for categories of STI (see Part II, Section 4.2).

Table 9. Acceptable Media and Transmission Method for Categories.

Transmission Media	Additional Specifications	Category
File Upload to OSTI	OSTI provides an upload interface via E-link	Unclassified, Unlimited
Diskette	1.44-megabyte, 3.5-inch diskette (magnetic storage media); zip disk	All
CD ROM		All
Tape	8-mm DAT magnetic media	All

Electronic submission of the STI product is preferred. Same-day transmission of both the metadata announcement record and the STI product is preferred so that receipt of the two items at OSTI is more likely to occur during the same time frame. If different methods of transmitting the record and the product are used, timing of the transmittal must be coordinated. For example, if a site uses the Web-based announcement record but mails an STI product (paper copy, CD, videocassettes, etc.), OSTI prefers receipt of both items to coincide as closely as possible. Additionally, STI products that are mailed should be clearly marked with the OSTI identification number for the corresponding announcement record.

While not recommended, paper (hard copy) will continue to be an acceptable information exchange medium during an interim/transition period, although it does require additional time for processing once received by OSTI. If paper is sent, OSTI requests only one copy for processing.

For STI products sent to OSTI in nonprint media (i.e., videocassettes, slides, CDs, etc., not electronic documents), one copy is preferred, accompanied by an announcement record containing a descriptive abstract and specific information about the medium (e.g., speed, machine compatibility, quantity/type of medium, physical description, color, playing time, and sound).

Through this interim period (1998 to 2004), OSTI will digitize paper inputs, using scanning technology, to output either TIFF Group 4 or PDF images for storage, conversion, and posting on the Internet (i.e., DOE Information Bridge). Because of digitization of text and electronic access to full-text information, sites may want to avoid having original signatures contained within an STI product (see also Part II, Section 5.3.6).

6.5 Announcing STI Products in a Distributed Environment

Working closely with STI partners across the Department, OSTI is leveraging the opportunities provided by the Internet to facilitate access to and use of the unclassified, unlimited STI generated by Departmental R&D programs. Many contractor-operated sites are developing Internet home pages that provide access to both metadata and full-text STI. To capitalize on that site investment, the Department has developed a system that ultimately will provide electronic access to the entire Departmental STI collection distributed at sites across the complex in a variety of formats.

In this distributed system, the Internet-accessible STI at each local site is being linked to a DOE-wide STI locator system, which in turn provides user access to electronic STI residing at the individual sites. This distributed system offers the following benefits:

- Removes the requirement for sites to submit full-text STI to OSTI. Sites can now submit metadata that indicates where the corresponding full text resides on the local Internet home pages. In turn, OSTI remotely accesses the electronic full text and fulfills its STI responsibilities.

- Levies no additional workload on sites already using the Internet technology to distribute STI.

- Eliminates duplication of effort where both the local site and OSTI are loading the same document on the Internet.

- Encourages sites to plan for electronic life-cycle STI management.

- Facilitates user access to the entire DOE STI collection.

For various reasons, some Internet-proficient sites do not make their entire STI collections accessible via the Internet; further, some sites are not yet able to use the Internet technologies. OSTI will negotiate special arrangements with these sites to acquire their electronic full-text STI for subsequent processing at OSTI. These exceptions to processing requirements will require adherence to mutually agreed-upon electronic formats and standards, which are further described in Part II, Section 6.5.1.

OSTI will continue to cooperate with sites to further streamline and enable harvesting of site-posted, publicly available STI collections accessible via the Internet.

6.5.1 Distributed Announcement and Product Availability

OSTI supports distributed access and dissemination of unclassified, unlimited STI for public availability. Site-posted STI (via an electronic repository or Web site) is accessed by OSTI when sites are able to participate in the distributed environment. Distributed announcement and product availability are supported by metadata in the announcement record supplied by the site to OSTI. Metadata elements will include the location of the document through provision of a Uniform Resource Locator (URL). Table 10 shows the relationship between site-posted or site-submitted STI in agreed upon formats and OSTI-supported processes.

NOTE: Electronic documents submitted to OSTI should not be "read only" or encrypted because of additional processing required at OSTI. Documents posted at the site should be publicly accessible.

6.5.2 STI Product Available from Originator

If a contractor or other DOE STI originator chooses to make its unclassified, unlimited STI products available through a site-hosted server rather than submitting them to OSTI, the following steps will enable OSTI to link to the STI product for subsequent indexing, user accessibility, and harvesting:

- Post STI products on publicly available server (outside any site-imposed "firewall") in a full-text accessible format.

- Provide to OSTI the metadata announcement record for the product, which includes the unique URL "pointer" to the full-text of the STI product. Approved methods to transfer metadata announcement records are described in Part II, Section 5.2.

- Keep the STI product posted at the specified URL with the same configuration.

- Notify OSTI of changes to the URL or to the server, etc.

For example, if the URLs for products change at a site, OSTI recommends the site revise the announcement records (see http://www.osti.gov/elink for more information).

Notice of other changes, such as the product's removal from the system or server changes, for example, should be provided to OSTI as well. The process to notify OSTI is dependent upon whether the action is considered unscheduled or scheduled.

Unscheduled: A contractor or other originator must take action because an STI product requires immediate removal or change. Reasons for this immediate action may include sensitivity issues, errors, etc. To avoid a broken link when removing the STI product, a contractor or other originator may choose to replace the STI product with a statement that would inform the user that the STI product is

no longer available and that gives contact information for help. In a timely manner, the contractor or other originator would also provide to OSTI a revised announcement record describing the change.

Table 10. Electronic Formats in a Distributed Environment.

Full-Text Document Format	Site Function	OSTI Function if Site Post	OSTI Function if Site Submits*
SGML XML HTML	Post at site and provide URL in DOE F 241.1 (alternatively post as HTML) or submit to OSTI	Index and link	Convert to HTML, index, and post
Corel Word Perfect (5.0+)	Convert to PDFN, post, and provide URL in DOE F 241.1; or submit to OSTI	Index and link	Convert to PDFN, index, and post
Microsoft Word (5.0+)	Convert to PDFN, post, and provide URL in DOE F 241.1; or submit to OSTI	Index and link	Convert to PDFN, index, and post
PDFN (PDF Normal)	Post as PDFN and provide URL in DOE F 241.1; or submit to OSTI	Index and link	Index and post
PDFI (PDF Image)	Submit to OSTI		OCR, index, and post
PostScript	Submit to OSTI		Convert to PDFN, index, and post
TIFF G4	Submit to OSTI		OCR, index, convert to PDFI, and post
Paper	Submit to OSTI		Scan, OCR, index, convert to PDFI, and post; convert to TIFF G4 for archival+

* Output products for the DOE Information Bridge (InfoBridge) will be in native (original) format in addition to HTML, PDF (Normal), or PDF (Image). Because electronic format conversion processes and scanning may not provide an exact representation of the original electronic document, users of InfoBridge will be advised of availability of the native format.

\+ In OSTI's capacity as the ultimate DOE repository for DOE's STI, OSTI has an agreement with the National Archives and Records Administration (NARA), which establishes OSTI's collection as a working file that exempts OSTI from providing its records to NARA. Provisions specify that OSTI will maintain the electronic

STI in its native format and migrate the STI, as required, to a NARA-acceptable format as the technology evolves to do so.

Scheduled: A contractor or other originator has decided to stop hosting specific STI products (i.e., STI products are being permanently removed from a site-hosted server); therefore, the site intends to transfer the STI product to OSTI for public access. The DOE O 241.1 Contractor Requirements Document requires contractors and other originators to notify OSTI of its intent to permanently remove an STI product from a site-hosted server. A minimum of 30 days advance notice is recommended before removing the STI product from the contractor's or other originator's server. The contractor or other originator will also provide to OSTI a revised announcement record to describe the change.

6.5.3 Transferring STI Product Availability from Originator to OSTI

As required in DOE O 241.1, the contractor must notify OSTI when permanently removing STI products from site-hosted servers. This notification allows OSTI to ensure continued availability of STI product after its removal from the site-hosted server. When OSTI receives the notice of intent, OSTI will obtain the STI product and include it in the central collection.

6.6 Announcing Classified STI Products

Classified STI products and the announcement record are submitted through official security channels. The announcement records will be made available through the CLEO system to authorized users in accordance with need-to-know and other security requirements.

6.6.1 Classified Product Availability

Classified STI may be obtained by authorized individuals in accordance with need-to-know by contacting OSTI through approved channels.

6.7 Archiving the STI Product

Whether submitted directly to OSTI or obtained by OSTI after local site public availability has expired, DOE STI R&D reports in the OSTI holdings will be scheduled and provided to the National Archives and Records Administration (NARA) consistent with that schedule.

OSTI serves as the ultimate repository for DOE's STI and will manage the collection for long-term retrieval. Often the collection maintained at OSTI is the only place that historic or specific technical information (such as for closed out projects) can be accessed. OSTI will address NARA requirements and make recommendations for archiving and storing DOE STI electronic records.

The DOE Research and Development Records Retention Schedule, Section 4, Research and Development Technical Reports, provides disposition instructions for closed-out projects. (This schedule can be obtained from the site records manager or at http://www-it.hr.doe.gov/records//.)

7. REQUESTS FOR PRINTED VERSION OF ELECTRONIC PRODUCTS

The preferred method for providing unclassified, unlimited document information to requesters is through electronic delivery, primarily through the base product, the DOE Information Bridge. DOE STI products requested by DOE and DOE contractors in paper form are available from OSTI, provided that such products have been made available to OSTI (through either submission to OSTI of the STI product or electronic linkage using acceptable formats). As DOE's NTIS affiliate, OSTI also will coordinate with NTIS to ensure that paper copies of unclassified, unlimited STI products are available to the public. Table 11 includes agreed-upon STI submission formats, associated access formats for Web view and download via the DOE Information Bridge, and interim archival formats.

Table 11. STI Submission, Access, and Archival Formats.

Submission Formats for Full-Text STI	Access Formats on InfoBridge* (Web/View)	Access Formats on InfoBridge (Download)	Archival+ Formats
HTML	HTML	HTML	HTML
XML	HTML	XML & HTML	XML
SGML	HTML	SGML & HTML	SGML
Corel Word Perfect (5.0+)	PDFN	Word Perfect (5.0+) & PDFN	Word Perfect (5.0+)
Microsoft Word (5.0+)	PDFN	Word (5.0+) & PDFN	Word (5.0+)
PDFN (PDF Normal)	PDFN	PDFN	PDFN
Postscript	PDFN	Postscript & PDFN	Postscript
PDFI (PDF Image)	PDFI	PDFI	PDFI
TIFF Group 4	PDFI	TIFF Group 4 & PDFI	TIFF Group 4
Paper	PDFI	PDFI	TIFF Group 4

* Output products for the DOE Information Bridge (InfoBridge) will be in native (original) format in addition to HTML, PDF (Normal), or PDF (Image). Because electronic format conversion processes and scanning may not provide an exact representation of the original electronic document, users of InfoBridge will be advised of availability of the native format.

\+ In OSTI's capacity as the ultimate DOE repository for DOE's STI, OSTI has an agreement with NARA that establishes OSTI's collection as a working file that exempts OSTI from providing its records to NARA. Provisions specify that OSTI will maintain the electronic STI in its native format and migrate the STI, as required, to a NARA-acceptable format as the technology evolves to do so.

PART III

DOE SCIENTIFIC AND TECHNICAL SOFTWARE

1. INTRODUCTION

Software management is currently transitioning from a centralized collection, announcement, and dissemination activity to a decentralized activity. During this transition, paper-based submission guidelines will be replaced with electronic submission guidelines for certain categories of software. New guidelines will also allow for distributed hosting and dissemination of certain categories of software.

A STIP work group was established in 1998 to develop the procedures necessary to transition scientific and technical computer software management to a decentralized environment. This part of the Guide has been revised to reflect the new procedures and will continue to be reviewed and changed, as new decentralized procedures are adopted. Procedures for announcing software and submitting software for dissemination are detailed in the following sections. The manner for distributing software is defined through the announcement and submission procedures.

1.1 Departmental Requirements

DOE O 241.1A requires that scientific and technical information (STI) (including scientific and technical computer software) be made broadly available, within applicable laws and Departmental requirements, to accomplish mission objectives and strategic goals, promote scientific advancement, satisfy statutory protection and public dissemination requirements, and ensure a fair return on Departmental and taxpayer investment. Specifically, DOE O 241.1A requires that useful STI products, including software, resulting from scientific and technical endeavors be made available and announced to OSTI so that OSTI can fulfill its announcement, dissemination, and exchange responsibilities on behalf of the Department.

1.2 Electronic Software Management

As part of the Department's transition to a decentralized, electronic STI management environment, steps were taken in October 1998 to decentralize STI products other than software. Software management is making a similar transition, effective October 2000, with the procedures necessary to transition scientific and technical computer software described in this Guide.

The objectives for decentralizing software management are to—

- consolidate and simplify announcement and submission procedures,
- use efficiencies offered by electronic network technologies,
- allow greater flexibility while meeting stated departmental requirements, and

- manage software in a manner similar to other STI products.

This transition will enable sites to continue announcing STI software through OSTI, but with the option to distribute software through OSTI, a Specialized Information Analysis Center (SIAC), or site-hosted on-line access, depending on certain criteria of the software. The criteria for useful software to be centrally announced and the categories of software appropriate for site hosting or for submission to OSTI are described in Part III, Section 3.

2. RESPONSIBILITIES

2.1 OSTI

OSTI, located in Oak Ridge, Tennessee, serves as the Department's central announcement mechanism for DOE-sponsored software. It also serves as the Department's software management facility for the collection, licensing, and distribution of Federally funded software that is developed by national laboratories and other DOE facilities/contractors (subject to the exceptions listed in paragraph 3.1). OSTI uses the services of the Energy Science and Technology Software Center (ESTSC) for software distribution.

OSTI also serves as the Department's liaison for software requests from sensitive countries. Upon a request for software from a sensitive country, OSTI coordinates any necessary reviews by the Office of Arms Control and Nonproliferation (NN-43) (see Section 4.2).

OSTI serves as the operating agent for implementing portions of the DOE international exchange agreements with the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development (OECD), which provides for the exchange of nuclear-related scientific and technical software.

OSTI works with SIACs—organizations sponsored by DOE to perform data analysis, including the collection, evaluation, announcement, and dissemination of computer software in specialized subject areas—to maximize its effectiveness, avoid duplication of efforts, and ensure that requesters are referred to an appropriate SIAC.

OSTI serves as the exclusive availability point, other than the copyright holder (or its licensees), for DOE and DOE-contractor originated software for which copyright has been asserted.

2.2 Specialized Information Analysis Centers

SIACs may receive and make available software within their scope of interest/operation, as described below. SIACs should ensure that an announcement record is provided to OSTI for each software package they receive and make available. OSTI and the SIACs should work together to ensure the implementation of consistent procedures for the dissemination of computer software in accordance with DOE O 241.1A. As determined by the applicable contract rights and technical data clause, OSTI may

share the right to license and distribute the software through a specific agreement with an individual SIAC. Recognized SIACs, as of the date of this Guide, are the following:

- The Radiation Safety Information Computational Center (RSICC) of the Radiation Information Analysis Section of the Oak Ridge National Laboratory (ORNL) specializes in computer programs and data sets pertinent to radiation transport and safety.

- The National Nuclear Data Center (NNDC) of Brookhaven National Laboratory (BNL) specializes in computer programs and data sets pertinent to nuclear cross sections.

- The Carbon Dioxide Information Analysis Center (CDIAC) of the Environmental Sciences Division of ORNL supports the nation's carbon dioxide-climate research effort by providing a focal point for the compilation and distribution of global-change-related information under systematic quality control.

- The National Petroleum Technology Office (NPTO) specializes in oil reservoir engineering software designed to assist the petroleum industry and maximize the economic production of domestic oil.

2.3 Software Originators/Creators

To centrally announce the availability of DOE's STI products, each DOE and DOE contractor element that originates useful software is required by DOE O 241.1A to provide an announcement record (an acceptable method to provide announcement information to OSTI is via DOE F 241.4). OSTI processes the record and announces the software's availability to the appropriate audience (DOE, other Government agencies, the public, etc.).

The originating site may distribute the software by submitting it to OSTI or an appropriate SIAC or by using local distribution channels, as appropriate (see Table 1 and Section 4.1). Software originators should ensure all software meeting the exception criteria in Section 3.1 is reviewed by the Office of Arms Control and Nonproliferation (NN-43) prior to its announcement or submission.

As required by DOE O 241.1A, software originators are to review all software for classified and unclassified sensitive information according to approved local procedures before sending to OSTI or a SIAC and before any distribution outside the organization is made. Software originators should also ensure all software is reviewed for export controlled information (see Attachment 4) in accordance with the *Guidelines on Export Control and Nonproliferation,* published by the Nuclear Transfer and Supplier Policy Division. The software should be clearly labeled if it is classified, contains unclassified sensitive information, or contains export controlled information. See Part II, Section 3, Appropriate Review Process to Release STI Products for Announcement, for instructions on labeling.

3. SOFTWARE ANNOUNCEMENT AND SUBMISSION

3.1 STI Software Appropriate for Announcement

Organizations and individuals who have developed and/or modified software during work supported by DOE or during work carried out for others at DOE facilities should announce the software with the appropriate announcement record to OSTI, if the software meets the following criteria:

- the software meets the definition of STI as defined in Part I, Section 4 of this Guide;
- the software is known or expected to have broad usefulness within or outside the DOE community (i.e., is useful outside the originating site); and
- a stable, useable, documented version of the software exists (i.e., the software is not under development).

Although all software that meets the above criteria is to be announced to OSTI, the software may be made available by either submitting the software package to OSTI, submitting it to a SIAC (for software of applicable scope for a SIAC), or hosting the software on the originating site's Web server (e.g., applicable freeware).

Exclusions. Software that meets the above criteria need not be announced to OSTI if it falls under one of the following exclusions:

- operational systems software that is site-specific, unique to a particular hardware, or necessary to ensure the fundamental operability of automated data processing equipment, whether supplied by the manufacturer of the system hardware or others and whether or not proprietary, which is not covered under a commercialization or copyright release request;
- computer software programs developed and/or modified during work carried out for others at DOE facilities specifically excluded in the agreement under which the non-DOE funded work was performed;
- software generated under the auspices of the Energy Information Administration; and
- specific software used by power administrations for the operation, control, planning, and modeling of electric power transmission systems and the interconnected utilities; however, modification/enhancements to portions of this software that are not an integral part of the whole and have potential application outside the power administrations should be announced.

Exceptions. Software meeting the following criteria should be reviewed by the Office of Arms Control and Nonproliferation (NN-43) to determine if public dissemination of the software would help proliferants. This review should be completed prior to announcing the software to OSTI, hosting the software on a Web server, or submitting the software to OSTI or a SIAC. The criteria are listed below:

- any software code identified as containing Export Controlled Information (ECI) (see Attachment 4) by the originator;

- software codes that contain algorithms for any of the following:
  - hydrodynamics,
  - radiative transfer,
  - high explosives detonation,
  - strength of materials,
  - equations of state;
- any software code that can be used for coupled neutron/photon/electron codes;
- compiled executables of the above;
- all codes with a version that fits the criteria above, even if the version of the code lacks one of the components specified above;
- any software code that would meet the above criteria if a publicly available code could easily be integrated into it.

3.2 Announcement/Submission Criteria

Software announcement requirements have been consolidated into one form (DOE F 241.4). To announce and make available a software package, the following components are considered necessary for inclusion in the package in order for the software to be provided to requesters:

- announcement record/metadata contained in DOE F 241.4, which includes all required information for announcing and describing the software;
- source code and/or executable file; and
- documentation, which may consist of a user manual, sample test cases, or similar information required for properly using the software (whether included in the software itself or provided in a separate file or in paper format).

3.3 Software Categories

Different categories of software have different distribution requirements or limitations. Table 12 defines the various software categories and identifies the appropriate distribution channels.

3.4 Announcement Record (Metadata)

Announcement record data is defined in DOE F 241.4. Beginning in FY 2001, software metadata may be submitted to OSTI electronically as part of the transition from centralized management to distributed access. Table 13 lists the data elements contained in the DOE F 241.4 announcement record, with required (R) and optional (O) fields noted.

Table 12. Software Categories.

Category	Description	Announcement	General Availability
Classified	Software that has been categorized according to DOE M 475.1-1	OSTI	OSTI
Declassified publicly releasable	Previously classified software that has been declassified	OSTI	OSTI/SIAC/site
Unclassified sensitive or other protected	Copyrighted – Software in which a DOE contractor has asserted rights. Proprietary Data/Trade Secrets Protected Data (e.g., software resulting from CRADA, SBIR, STTR) UCNI—Software that is protected by law from disclosure to persons not having a need-to-know the information without appropriate review by DOE. Program-Directed Special Handling EXAMPLE: Applied technology—Software related to engineering, development, design, construction, operation, or other activities pertaining to nuclear technology advances (see Attachment 4 for details).	OSTI/Limited Announcement	OSTI or in accordance with DOE-approved site agreements
Export Controlled Information (ECI)	Software containing unclassified information subject to export controls and whose unrestricted public dissemination could help proliferants or potential adversaries of the United States.	OSTI/limited announcement	OSTI

Table 12. Software Categories (continued).

Unclassified unlimited (freeware, other)	Freeware—Software distributed, after all appropriate reviews, by the developing site at no charge. Thought to have general value to other application domains. Level of user support provided is determined by the developing site and communicated to the user. May be Web hosted or distributed in other manners deemed appropriate by the sites.	OSTI/sites (i.e., OSTI and the sites may both announce the availability. OSTI will use data provided in DOE F 241.4 in announcing the software.)	Sites (Although OSTI will announce the software, originating site is the source of availability for requesters.)
	Other—Software that is not freeware according to the definition provided. Software a contractor develops, but does not copyright, and is fully willing to make available through OSTI or the specialized centers.	OSTI/SIAC/sites	OSTI/SIAC/sites

NOTE: This table is not intended to be an exhaustive list. Contact OSTI if you have questions regarding the appropriate announcement or distribution channel.

4. SOFTWARE ACCESS

4.1 Distribution of Software

After submission or announcement to OSTI, software may also be made available by the developing organization in accordance with the categories in Table 1, consistent with approved local procedures, and only with authorization of the cognizant management. Agreements to prevent further dissemination and to protect intellectual property rights should be obtained (see Table 1).

4.2 Software Dissemination

DOE O 241.1A requires that all STI, including STI software, generated by DOE and its contractors be reviewed for sensitivity (including nonproliferation, national security, and export control) and appropriate announcement and availability restrictions applied. Software originators should not disseminate copies of software packages to foreign nationals without first ensuring the export is lawful in accordance with Federal export regulations, to include those published by the Department of Commerce (15 CFR 730-774), the Department of Energy (10 CFR 810), the Department of State (22 CFR 120-130), and the Nuclear Regulatory Commission (10 CFR 110). Even dissemination of software packages to foreign nationals within the United States may be considered a “deemed export” and may require an export license in accordance with the Federal export regulations.

Table 13. DOE Software Metadata Elements.

Metadata Element	R	O	Description
Record Status	X		Identifies the software product as new or revised.
STI Product Title	X		The title, acronym, and short KWIC (keywords in context) title of the software.
Software Developer(s)	X		Unlimited number is acceptable; the primary software developer should be listed first. Allows for "NONE" as an option for few cases where necessary.
E-mail Address(es)		X	Provide in same order as author names. Will not be available to the end-user.
Site Product Number		X	Unique site number that identifies software product.
Contract Number	X		Required for all (can be "NONE").
R&D Project ID		X	A unique and permanent ID assigned to identify a particular research project or funding source.
Other Identifying Number(s)		X	If appropriate, includes CRADA number, LDRD number, B&R code, etc.
Originating Research Organization(s)	X		The organization/site submitting the software.
Release Date	X		Identifies the software release date. Standard format to be followed (e.g., follow rules of inputting), but requires standard four-digit year.
Sponsoring Organization	X		The sponsoring or funding office of the work reported in the STI product. Allows for "NONE" as an option for few cases where necessary.
Description/Abstract	X		Text should be spell-checked, limited in length to 9000 characters, and in compliance with input standards for special characters. Describe the purpose of the computer program, state the problem being solved and summarize the program functions and capabilities (highlight the advantages, distinguishing features, and/or special capabilities). Provide a short summary of the mathematical methods, engineering principles, numerical algorithms, and procedures incorporated into the software.

Table 13. DOE Software Metadata Elements (continued).

Metadata Element	R	O	Description
Hardware Requirements	X		Platform field with pick list: PC, Mac, Supercomputer, Mainframe, Multiplatform, Other
Software Requirements *Operating System and Version* *Compiler and Version* *Limitations/Restrictions/Timing requirement estimate/Other special requirements* *Related/Auxiliary Software* *Type of Files*	X *X* *X* *X* *X* *X* *X*		Pick List: source code, text library, object library, user guide, executable module(s), auxiliary materials, compilation instructions, linking instructions, sample problem input data, sample problem output data, control information, program flow diagram, program flow data, programmer documentation, installation instructions, other
Media Type	X		Field: pick list with choices and subelements based on choice Diskettes: number, type: IBM PC, Mac, UNIX workstation (tar format), capacity Zip disk: number, type: IBM PC, Mac, UNIX workstation (tar format), capacity Electronic transfer: URL or FTP (upload via E-Link) 8-mm Cassette tapes: number, capacity, format: ASCII/ANSI, UNIX TAR, VAX VMS back-up Compact disk (CD): number, capacity
Documentation	X		Pick list: paper, electronic document (with pick list for URL, FTP, online documentation) other media
References		X	List citations of pertinent publications by author, title, report number, bar code, or order number if available, and date. References are to be grouped as: (1) reference documents provided with the submittal package and (2) additional background reference materials generally available.

Table 13. DOE Software Metadata Elements (continued).

Metadata Element	R	O	Description
Access Limitation	X		One selection is required. Non-conflicting multiples are allowed. Includes minimum supporting fields (e.g., release dates): Unlimited Announcement, OpenNet, U.S. Dissemination Only, Copyrighted Material, SBIR, STTR, Proprietary/Trade Secret, Patent Pending, Protected Data, Program Directed Special Handling, Export Controlled Information (ECI), UCNI, Classified, Other information relevant to access.
Availability (Refer requests to)		X	Required if applicable
Contact	X		Site contact that will receive any external questions about the software.
Releasing Official	X		Site's designated official(s) who ensure that all appropriate sensitivity and export control reviews are completed (i.e., patent, copyright, UCNI, etc.)
Other		X	To be used for other useful information related to the software. Will be included in the published announcement record.

All requests for software from sensitive countries should be sent to OSTI for coordination of approval from NN-43. If approved, the appropriate requesting site may then disseminate the software to the requester. The list of sensitive countries is available from the OSTI Web site at http://www.osti.gov/estsc. (NN-43 is responsible for maintaining the list.)

4.3 License Agreements

4.3.1 Copyrighted Software

Software for which the developing DOE contractor organization has not asserted copyright (for commercialization purposes) is available to the public subject to the license agreement described below. Software for which the contractor has asserted such rights is not publicly disseminated but is available to DOE contractors and other government organizations from OSTI in accordance with the terms of the developer's contract with DOE. Requests for copyrighted software from those other than DOE contractors or governmental entities are referred by OSTI to the copyright holder (or their licensees) for licensing.

4.3.2 OSTI Software License

Any DOE-sponsored software package distributed by OSTI's ESTSC requires a license agreement. This form (see Attachment 9) establishes conditions and requirements for requesters' use of the software package after purchase from OSTI's ESTSC. Requesters must return the properly completed and signed form to OSTI before processing the order. OSTI encourages SIACs to follow this Departmental policy.

Under the international exchange agreement with the NEA, OSTI has determined that NEA distribution procedures are appropriately consistent with OSTI's licensing policy; therefore, the NEA is not required to sign license forms for packages they receive from OSTI or SIACs covered by the exchange agreement.

4.3.3 Disclaimers for Software

Rights-in-technical-data clauses for many DOE contracts require a statement acknowledging DOE sponsorship/data rights for information products. The following distribution statement and disclaimer meet those requirements for software and should be affixed to all distributed DOE-sponsored software. Legal counsel should review any appropriate additional markings that are desired; such markings should be consistent with restrictions indicated on the announcement form (DOE F 241.4). Markings should be affixed to all software package elements provided to the OSTI or a SIAC.

Distribution Statement

The following distribution statement should be included on all software subject to license agreements:

> This computer software has been developed under sponsorship of the U.S. Department of Energy. Any further distribution or use by anyone other than the named licensee of this software package or any data contained therein, unless otherwise specifically provided for, is prohibited without the approval of the Office of Scientific and Technical Information. Requests for DOE-developed computer software shall be referred to the Energy Science and Technology Software Center at the Office of Scientific and Technical Information, P.O. Box 1020, Oak Ridge, TN 37831-1020.

Disclaimer

The following disclaimer should be included on all software subject to license agreements:

> This material was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the United States Department of Energy, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

CONCEPT PAPER ON ELECTRONIC STI MANAGEMENT

Presented at DOE STIP Meeting, February 3, 1998

Background

The Office of Scientific and Technical Information—like the entire Scientific and Technical Information Program (STIP) community—is in a state of transition to electronic STI. OSTI is re-engineering its paper-based processing of incoming scientific and technical information, with accompanying workflow tasks and software designed for paper reports, to a primarily electronic processing environment. With this change, it is redesigning a number of processes using new software, new descriptions of the workflow functions, and generally a new perspective on the requirements.

In 1994, OSTI and its STI partners and stakeholders recognized that the Departmental STI Program was in a changing environment of—

- less centralized control;
- reduced reliance on compliance; and
- more focus on outcome than process.

Over the past four years, OSTI and the STI community together have made significant strides in defining agreeable electronic exchange formats; streamlining paper-based processes to the bare essentials; creating collections of digitized STI; and developing the Energy Science and Technology Virtual Library: Energy Files. Energy Files is envisioned as the umbrella system for the STI collections and more. Now, with the STIP Strategic Plan as the blueprint and coupled with the latest information technologies, the Department's STI Program is positioned to define the next generation of STI access and dissemination processing in a decentralized environment. This paper provides a concept of the approach to be taken, envisioned changes, roles and responsibilities of involved parties, and the anticipated benefits.

Future Approach to Electronic STI Processing

Changes at OSTI

OSTI is committed to meeting the paper-to-electronic challenge in FY 1998. Right now, it is in the midst of planning and defining significant changes within OSTI's processing systems which will allow greater flexibility to all those who submit STI. These changes will forever alter the Department's STI Program.

- OSTI is procuring commercial-off-the-shelf software to replace the existing inflexible Report Processing System and affiliated processes. A new database management system, electronic

document management system, and other associated hardware/software platforms will be in place by the end of FY 1998 which will make better and easier use of network technology, provide automated workflow, and broaden acceptance of electronic formats.

- The new system configuration and functional requirements will be defined to meet the needs of our primary customers and stakeholders. Considerations include—
  - reduction of bibliographic data requirements to a core set of metadata for DOE's STI collections;
  - acceptance of a range of native full-text formats;
  - empowerment of originators in the review, release, and quality-assurance standards for STI; and
  - providing a final repository for the originating sites or programs which do not intend to host public access to full-text documents permanently.
- The design is largely to expedite electronic full-text and electronic metadata, although the system will accommodate paper STI to a lesser extent when needed.
- The focus of OSTI staff will be on value-added functions, such as subject analysis or product innovation, proactively supporting the needs of the STI originating sites, providing problem resolution, facilitating life-cycle practices, as well as serving the full-text needs of the end-users. The redesigned process will require fewer resources for routine processing and creation of bibliographic databases.

What remains **unchanged** is OSTI's dedication to meet the needs of its customers and stakeholders who desire access to DOE's STI. OSTI will continue to maintain a central locator to DOE's STI through the DOE Information Bridge, which will be innovatively improved over the next few months. OSTI will continue to fulfill Departmental mandates for broad public dissemination by administering various agreements with intermediaries for public access to include NTIS, GPO, and international exchanges. Agreements with external partners will be modified to reflect the changing environment for electronic STI.

Acknowledging Efforts of Originating Sites

- Sites routinely review the STI product prior to publication for proper clearances such as patent or intellectual property review, classification review, and other approvals. OSTI has traditionally provided a second review to ensure that markings were consistent and that only appropriate documents were publicly released. Electronic or Web-based publishing through distributed sources makes a second review by OSTI impractical and unwarranted. Therefore, OSTI will be eliminating most of its evaluation function and will accept the release and announcement markings provided by the sites.

- Validation of metadata elements provided to OSTI in the future will be accomplished via automation as much as possible; rules will be relaxed significantly. Some consistency will be built in by having computerized pick-lists for certain metadata elements provided to the sites. Which "authorities" are needed will soon be determined. However, the traditional OSTI process of intervening through manual input or editing of data will be significantly curtailed.

- The advent of site-hosted publicly accessible servers has also changed who accounts for public release. Traditionally, DOE's external stakeholders (OMB, GAO, Congress, and others) have relied on OSTI's publication dates as the official public release record for DOE's STI. Both credit and accountability will properly rest with the site which publicly releases and makes STI openly available.

- A broader range of electronic full-text formats, such as standard word processing formats, will be accommodated in the redesigned process. OSTI will be able to carry the native format (one of the accepted formats in which the originating site created the STI) for certain uses, as well as making a number of electronic formats available for access in STI products (such as DOE Information Bridge). OSTI currently has scanned over 23,000 DOE technical reports and made them available through the DOE Information Bridge. Significant costs and issues exist in the search/retrieval, user access, and the required hardware/software systems to handle such information. Scanning will continue, on a decreased basis, until hard-copy submittal of information is eventually phased out. This change in practice will allow users to view the STI product in its original version as created by the site, in addition to accessing the product in a standard format (currently TIFF G4 is used, but OSTI is planning for a future standard to be a full-text searchable format, although transition plans are not firm at this time).

Roles & Responsibilities

In this new electronic paradigm, traditional roles and responsibilities of OSTI will change, as will the role of submitting sites. The distributed processing model which is envisioned would include the following:

- A reduced set of metadata would be provided by sites to OSTI in lieu of the current data provided on DOE F 1332.15. The metadata record would serve as the official notification of the release and announcement of an STI document/product. There will be a number of methods for providing the metadata: (1) via a new Web form similar to the process for using the Web version of DOE F 1332.15; (2) batch processing from site databases that capture the metadata during the site's document preparation; or (3) Attachment 1 providing appropriately tagged elements accompanying an electronic full-text document.

- Methods for including electronic full-text documents into the "DOE collection" will also be broadened. Envisioned are: (1) a full-text document may be transmitted to OSTI with the corresponding metadata; (2) the site may post it at a location for OSTI to capture it upon notification via the metadata; or (3) the site may choose to host access to the full-text and

provide OSTI the metadata record with a unique URL to link to each full-text document on the site's server.

- OSTI will then process the incoming metadata through automated validations and authorities and create a "metadata repository" as a central locator of DOE's STI.

- Based on STIP stakeholder feedback, OSTI intends to continue to provide subject expertise for search/retrieval purposes and to use automated tools to the extent possible to create subject categories, keywords, and abstracts when not provided by the sites. OSTI will potentially maintain controlled vocabularies/thesauri to facilitate subsequent search/retrieval and dissemination.

- Metadata stored in the central repository will provide the locator to all full-text, which will be made available to users through an improved DOE Information Bridge that incorporates distributed linking and searching features such as those tested in the Federated Collections Pilot project, but with the additional feature of providing a comprehensive full-text index to DOE's STI, which will serve as a key component of Energy Files.

- In the near term, OSTI will maintain the capability to process paper-copy received from sites unable to submit electronic full-text documents in one of the accepted formats, but the priority for processing and access will be lower than for the electronic documents.

Benefits

Several benefits will occur within the DOE STI community as a result of a Departmental redesigned electronic STI management concept:

- Places management of information closer to originator, who best knows the information.

- Recognizes the site which created and made the STI available.

- Imposes less control and compliance.

- Focuses on the outcome (broader access to STI) rather than the process.

- Reduces costs incurred for processing paper documents.

- Improves timely availability of scientific and technical information.

- Establishes the framework for distributed access to scientific and technical information across disparate Departmental sites.

- Reduces processing costs of the sites through the acceptance of more electronic native formats.

- Positions the Department to better respond to changing technologies.

- Eliminates creating and maintaining duplicative data systems (at sites and at OSTI), thus saving costs for STI processes DOE-wide.

- Encourages/facilitates STIP community to identify and implement best business practices associated with electronic STI life-cycle management.

- Promotes integration of the STI Program across the Department.

Summary

Based on the Departmental needs, the changing technology, the growing end-user expectations for full-text at the desktop, and budget restrictions, OSTI is proposing an aggressive time line for the initial implementation of this concept. To meet that commitment, several factors must be addressed quickly and consensus reached by all parties involved. We will use all available resources in the near-term to identify and define a smooth transition plan. Through the STIP goal working groups, implementation guidelines will be created for the metadata record and electronic formats. STICG and other Headquarters forums will be used to notify the funding programs and to obtain buy-in on the role of the sites which create STI and the role of OSTI. The Order and the Guide will then document these agreed-upon changes.

AUTHORITIES AND OTHER GUIDANCE

Dissemination of scientific and technical information (STI) resulting from Department of Energy (DOE) research and development programs to promote scientific progress and public understanding has been a fundamental requirement since the founding of the Department and its predecessor agencies. A number of laws require the Department to make its information available, while others place some limits on the dissemination of scientific and technical information for which the unauthorized release would be detrimental to national interests. DOE O 241.1A provides the overall DOE objective, requirements, and responsibilities within which these mandates are to be met. Following are statutes, Executive orders, and directives relevant to the management of STI.

- American Technology Preeminence Act of 1991, Public Law 102-245, dated 2-14-92.
- Arms Export Control Act, Public Law 94-329 (22 U.S.C. 2751 et seq.)
- Assistance to Foreign Atomic Energy Activities, Title 10, Code of Federal Regulations, Part 810, effective July 26, 1993.
- Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011-2296.
- Classified National Security Information, Executive Order 12598, 4-20-95.
- DOE O 5610.2, CONTROL OF WEAPON DATA, dated 8-1-80
- Copyrights, 17 U.S.C.101-601 et seq.
- Department of Energy Organization Act of 1977, Public Law 95-91, Title I, Section 102.
- *DOE Scientific and Technical Information Program Strategic Plan: A Complex-Wide Collaboration to Lead DOE in the Information Age,* Office of Scientific and Technical Information, dated 9-17-97.
- DOE Strategic Plan, September 1997.
- Energy Policy Act of 1992, Public Law 102-486 (42 U.S.C., various sections).
- Electronic Freedom of Information Act Amendments of 1996, Public Law 104-231 (5 U.S.C. 552).
- Energy Conservation, Public Law 102-381, Title II, 106 Stat. 1405 of 10-05-92.
- Export Administration Act of 1979, Public Law 96-72, as amended (50 U.S.C. 2401).

- Export Administration Regulations, Title 15, Code of Federal Regulations, Parts 730-799.
- Export and Import of Nuclear Equipment and Material, Title 10, Code of Federal Regulations, Part 110.
- Federal Information Resources Management Regulation, Title 41, Code of Federal Regulations, Chapter 201.
- DOE O 1500.3, FOREIGN TRAVEL AUTHORIZATION, dated 2-6-94
- Freedom of Information Act of 1974, Public Law 89-487, as amended by Public Law 93-502 (5 U.S.C. 552, 88 Stat. 1561).
- *Guidelines on Export Controls and Nonproliferation*, issued by the Director of the Office of Nonproliferation and National Security, July 1999.
- Identification and Protection of Unclassified Controlled Nuclear Information, Title 10, Code of Federal Regulations, Part 1017.
- DOE O 471.1, IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION, dated 9-25-95.
- DOE M 475.1-1, IDENTIFYING CLASSIFIED INFORMATION, dated 5-8-98.
- DOE G 1324.5B, IMPLEMENTATION GUIDE FOR USE WITH 36 CFR CHAPTER XII - SUBCHAPTER B, RECORDS MANAGEMENT, dated 7-19-96.
- DOE O 200.1, INFORMATION MANAGEMENT PROGRAM, dated 9-30-96.
- *Information Processing Text and Office Systems Standard Generalized Markup Language (SGML)*, ISO-8879, International Standards Organization.
- DOE O 471.2A, INFORMATION SECURITY PROGRAM, dated 3-27-97.
- International Traffic in Arms Regulations, Title 22, Code of Federal Regulations, Parts 120-128.
- Management of Federal Information Resources, Office of Management and Budget (OMB) Circular A-130 of 6-93, as amended 7-15-94. Supersedes OMB Circulars A-3, A-71 partial, A- 90, A-108, A-114, and A-121.
- Metric Conversion Act of 1975, Public Law 94-168, as amended by Public Law 100-418.

- Metric Conversion Policy for Federal Agencies, Title 15, Code of Federal Regulations, Part1170.
- Metric Usage in Federal Government Programs, Executive Order 12770 of 7-25-91.
- National Competitiveness Technology Transfer Act of 1989, Public Law 101-189 (15 U.S.C. 3701).
- National Technology Transfer and Advancement Act of 1995, Public Law 104-113.
- Naval Reactor and Military Application Programs, Public Law 98-525 (42 U.S.C. 7158).
- Nuclear Non-proliferation Act of 1978, Public Law 95-242.
- Printing, Title 48, Code of Federal Regulations, Part 952.227, "Provisions and Clauses Related to Patents, Technical Data and Copyrights" [952.227-79 "Limited Rights in Proprietary Data"].
- Privacy Act of 1974, Public Law 93-549, as amended (5 U.S.C. 552a).
- Rights in Data General, Federal Acquisition Regulation (FAR) 52.227-14.
- Stevenson-Wydler Technology Innovation Act of 1980, Public Law 96-480, 15 U.S.C. 3710a note.
- U.S. Patent Law, 35 U.S.C. 205.

DEFINITIONS

Abstract. Concise statement (200 words or less) of the purpose, scope, and major findings of a scientific and technical information (STI) product.

Announcement. Transmission to the Office of Scientific and Technical Information (OSTI) of an announcement record (DOE F 241.1, DOE F 241.3, or DOE F 241.4) or announcement record and entire STI product. OSTI will control access based upon the needs of the STI product.

Announcement Record. Record containing metadata used to describe an STI product for announcement and availability. The record is based on DOE F 241.1, DOE F 241.3, or DOE F 241.4 and transmitted to OSTI for general announcement.

Copyright Statement. Statement that retains the nonexclusive right for the government to copy STI that was funded by a government agency although the copyright may be owned by a non- government entity. (See Attachment 4.)

Deliverables. End-product or outcome of a funded project or program and identified in a contract or work proposal.

Departmental (or DOE) Elements. First-tier organizations at Headquarters and in the field. First-tier at Headquarters is the Secretary, Deputy Secretary, Under Secretary, and secretarial officers (assistant secretaries and staff office directors). First-tier elements in the field are managers of the eight operations offices, managers of the three field offices, and the administrators of the power marketing administrations. Headquarters and field elements are described as follows: (1) Headquarters elements are DOE organizations located in the Washington Metropolitan Area; and (2) field elements is a general term for all DOE sites (excluding individual duty stations) located outside of the Washington, D.C., Metropolitan Area.

Disclaimer. A repudiation or denial of responsibility or connection.

Distribution Statement. Statement needed on an STI product that explains any distribution or access limitation. (See Attachment 7.)

Extensible Markup Language (XML). XML (version 1.0 or above) is a true subset of Standard Generalized Markup Language (SGML), designed to make it easy to interchange structured documents over the Internet. XML files always clearly mark where the start and end of each of the logical parts (called elements) of an interchanged document occurs. XML somewhat restricts the use of SGML constructs and defines how Internet Uniform Resource Locators can be used to identify component parts of XML data streams created specifically for use on the World Wide Web. XML is an abbreviated version of SGML, omitting the more complex and less-used parts of SGML in return for the benefits of being easier to write applications and more suited to delivery and interoperability over the Web. XML files may still be parsed and validated in the same way as any other SGML file.

NOTE: Included graphic files should be either in Graphic Interchange Format (GIF) or Joint Photographic Experts Group (JPEG) format as they are the standard graphic file types for World Wide Web (WWW) accessible documents.

File Format(s). The electronic format of an electronic STI product. Acceptable electronic formats have been identified for the STI products posted on site's Web pages and transmitted to OSTI.

Foreign Trip Reports. Foreign trip report information, which is maintained in a secure database accessible to DOE and authorized users. It is sponsored by the Office of Nonproliferation and National Security (NN).

HyperText Markup Language (HTML). HTML is a non-proprietary format for publishing documents on the Web. Based upon SGML, HTML can be created and processed in a wide range of tools from simple plain text editors to sophisticated authoring tools. HTML uses tags to structure text into headings, paragraphs, lists, hypertext links, etc. HTML documents that conform to the HTML 3.2 or 4.0 document type definition (DTD) are by definition fully compliant SGML documents for the STI electronic environment. NOTE: Included graphic files should be either in GIF or JPEG format as they are the standard graphic file types for WWW accessible documents.

Laboratory Directed Research and Development (LDRD). Research and development work of a creative and innovative nature that is selected by the laboratory director, or his or her designee, for the purpose of maintaining the scientific and technological vitality of the laboratory and responding to scientific and technological opportunities in conformance with the requirements of the LDRD Program. The LDRD Program includes all discretionary research and development activities not provided for in a DOE program.

Life-Cycle Information Management. Life-cycle information management indicates that information resources need to be managed as long as they are useful. The activities involved include planning, coordinating, budgeting, organizing, protecting, delivering, storing, and disposition.

M&I Contractors. Management and integration contractors.

M&O Contractors. Management and operating contractors.

Metadata. Data that describes the attributes of a document or other type of STI product and is used for announcement and retrieval.

Non-M&O/M&I Awards. Non-M&O/M&I awards that are usually let by DOE contracting officers in the form of grants, contracts, cooperative agreements, etc.

Office of Scientific and Technical Information (OSTI). The DOE office within the Office of Science that is the central point of coordination for the Department's Scientific and Technical Information Program. While scientific and technical information is primarily generated and managed at

DOE field and contractor sites, the OSTI facility is the central point of coordination for customer access to DOE's scientific and technical information resource.

OpenNet. A Web-based database of all Departmental documents that have been declassified and determined to be publicly releasible (http://www.doe.gov/html/osti/opennet/opennet1.html). OpenNet supports the DOE openness initiative and contains not only STI products but other records as well. It is sponsored by the Headquarters Office of Declassification, NN-52.

Originating Site. A term used in this Guide to denote the organization that prepares and makes available an STI product. In some cases, it is the same as the originating research organization (either DOE or DOE contractor). For non-M&O/M&I-generated STI products, the DOE awarding office may fulfill or delegate this role.

PostScript. A page description language that allows documents to be transmitted electronically with all original formatting and graphics intact, it is an established industry standard. OSTI is currently accepting PostScript as an exchange format because, in addition to being an industry standard for document printing, it is a format that is easily converted to other media (e.g., paper, fax, PDF, image formats, etc.). PostScript files can be saved from standard word processing packages such as Microsoft Word or Corel's Word Perfect.

Postprint. A document in post-publication status, particularly an author's article or paper, after it has been published in a journal.

Preprint. A document in pre-publication status, particularly an article submitted to a journal for consideration for publication or other commercial publication.

Presentation Formats. Formats that capture the "Presentation" form of a document (i.e., the look of the document when printed). Presentation formats may or may not be full- text searchable. OSTI prefers to receive full-text searchable versions of documents.

Proprietary Data. Information that embodies trade secrets developed at private expense outside of a Cooperative Research and Development Agreement and commercial or financial information that is privileged or confidential under the Freedom of Information Act, 5 U.S.C. (B)(4) and that is marked as proprietary information. Information that contains trade secrets or commercial or financial information which is privileged or confidential, and may only include such information that (a) has been held in confidence by its owner; (b) is of a type customarily held in confidence by its owner; (c) has not been transmitted to other entities except on the basis that it be held in confidence; and (d) is not otherwise available to the receiving party from another source without restriction on its further dissemination.

Portable Document Format (PDF). PDF, a proprietary format owned by Adobe Systems Incorporated, can best be described as an enhancement of the PostScript format. The PDF format maintains almost complete fidelity to the original document and is an efficient solution for providing electronic access to documents. Through the use of Adobe's Acrobat PDF Writer driver, PDF files can be created by printing to a PDF file from multiple word processing and other desktop publishing

applications. By using a viewing application freely available via the Internet such as Adobe Acrobat Reader, PDF files can be browsed on-screen or they can be printed to local or remote printers. PDF files can be searched through the viewing application or through proprietary database engines that provide filters for the format. The most current version of PDF supports the addition of hyperlinks to multimedia objects and Internet uniform resource locators (URLs).

R&D Project Identification Number. A unique and permanent project identifier that is assigned to an R&D project by either the DOE operations office, DOE program office, DOE laboratory, or other DOE organization. The project ID should be included as a reference on the STI deliverable or accompanying transmittal document to relate the deliverable to the appropriate R&D funding source.

Reprint. A copy of a journal article or similar document obtained from the publisher in the form in which it was published and may be copyrighted by the publisher.

Scientific and Technical Information (STI). STI consists of information products, in any format or medium, derived from scientific and technical studies, work, or investigations that relate to research, development, demonstration, and other specialized areas such as environmental and health protection and waste management. Scientific and technical information products may be unclassified unlimited, unclassified sensitive, export controlled, classified, or declassified. DOE-funded STI originates primarily from research and other activities performed by contractors for management, operation, or integration of DOE-owned/leased facilities, direct DOE-executed prime procurements, DOE-operated research activities, and financial assistance recipients, in addition to DOE employees.

Sensitive Unclassified Information. Information for which disclosure, loss, misuse, alternation, or destruction could adversely affect national security or government interests. National security interests are those unclassified matters that relate to the national defense or foreign relations of the Federal Government. Governmental interests are those related, but not limited to, the wide range of government or government-derived economic, human financial, industrial, agricultural, technological, and law enforcement information, as well as the privacy or confidentiality of personal or commercial proprietary information provided the Federal Government by its citizens.

Site. See definition for "Originating Site."

Scientific and Technical (S&T) Accomplishment Report. An S&T accomplishment report describes an outcome of R&D that has significantly affected commerce or standard of living or is recognized as a major scientific or technical advancement. It reports scientific or technical results, as opposed to a research highlight, which describes a noteworthy current R&D project or field of investigation that, if successful, could lead to an S&T accomplishment.

Standard. A generic, all-encompassing term used to describe documents that provide a specified set of mandatory or discretionary rules, requirements, or conditions concerned with performance, design, operation, or measurements of quality to accomplish a specific task. Standards may include Federal laws, regulations, State laws, Federal agency directives, national and international technical standards, codes of conduct, or even organizational "internal use only" documents. "Standard" includes a

specified set of discretionary rules or conditions concerned with the classification of components; delineation of procedures; definition of terms; specifications of materials, performance, design, or operations; or measurements of quality in describing materials, products, systems, services or practices.

Standard Generalized Markup Language (SGML). SGML is an international standard (ISO-8879) for defining document structures for the application of mark-up schemes. It provides a consistent and precise manner of applying mark-up for describing the component parts of a document, enabling the exchange of revisable documents between different computer systems. Use of SGML for electronic exchange is an agreed-upon long-term goal for DOE's STI. Two additional SGML-based formats are also acceptable for STI: the Extensible Markup Language (XML) and the Hypertext Markup Language (HTML). NOTE: Included graphic files should be either in GIF or JPEG format because they are the standard graphic file types for WWW accessible documents.

Sponsoring Organization. Also known as the funding office, the sponsoring organization is typically the DOE Headquarters program office, that funds/sponsors the research activities.

Technical Report. Technical reports describe the results and findings of research and development projects and other DOE-funded activities. For direct-procurement type awards, technical reports are formal documents usually identified as required reporting deliverables and may cover a specified time frame referred to as the reporting period. For M&O/M&I contractors, in addition to formal reports, these may be any technical document that contains technical information useful to others, including the results of research determined not appropriate or rejected for open literature publication.

TIFFG4. An acceptable interim format for electronic exchange of STI is TIFF Group 4. TIFF Group 4 is currently being used by a number of DOE and DOE contractor activities. To ensure consistency, a standard for submissions to OSTI is TIFF CCITT Group 4.

Word Processing Formats (e.g., Corel Word Perfect and Microsoft Word). Word processing documents are those documents created through proprietary document creation applications. OSTI will accept electronic documents in Word Perfect 5.0 and above or Microsoft Word 5.0 or above. Word Perfect and Word were chosen because they are the two most heavily used word processing applications in the DOE complex.

NOTICES AND RESTRICTIVE LEGENDS

Before a scientific and technical information(STI) product is released for announcement and availability, it is marked with any appropriate notices, restrictive legends, and distribution statements. Selection of the necessary markings is based on the Department of Energy (DOE) or contractor review of the STI, as described in Part II, Section 3 of the Guide. The various types of markings follow.

1. NOTICES [pertaining to availability of information]

Applied Technology Correspondence Notice

The attachment contains applied technology information requiring conformance to U.S. Department of Energy program policy and the Applied Technology legend.

Copyright License

By acceptance of this article, the publisher and/or recipient acknowledges the U.S. Government's right to retain a nonexclusive, royalty-free license in and to any copyright covering this paper.

Energy Science and Technology Software Center (ESTSC) Distribution

This computer software has been developed under sponsorship of the U.S. Department of Energy. Any further distribution or use by anyone other than the named licensee of this software package or any data contained therein, unless otherwise specifically provided for, is prohibited without the approval of the Energy Science and Technology Software Center. Requests for DOE-developed computer software shall be directed to the Energy Science and Technology Software Center, P.O. Box 1020, Oak Ridge, TN 37831-1020.

Thesis (or Dissertation)

This document was prepared in partial fulfillment of the requirements for a Master of Science degree in Chemical Engineering from the University of Washington, Seattle, Washington. (fill in appropriate information)

UCNI Correspondence Notice

Not for Public Dissemination. The document transmitted herewith contains unclassified controlled nuclear information (UCNI). The bearer shall maintain physical control of the document or material while in use in a manner that prevents its unauthorized access. When not in use, any document or material marked as "contains UCNI" shall be stored in a locked drawer of a desk or repository or in a locked room. Further reproduction of the document or information

to authorized individuals shall be permitted only to the extent necessary to carry out official duties. Any reproduced copies must bear all protection notices shown on the original.

2. DEFINITIONS AND RESTRICTIVE LEGENDS [limits the use of information]

Applied Technology

Applied technology is an unclassified category of information established by DOE's Office of Nuclear Energy, Science and Technology (NE) to preserve the foreign trade value of certain NE-funded progress and topical reports containing engineering, development, design, construction, and operation information pertaining to particular programs [defined in guidance available from NE or the Office of Scientific and Technical Information (OSTI)], as designated by the cognizant NE program office. Such designation is indicated through contractual requirements or in the task orders under which such information is developed.

Documents/software identified as applied technology are given monitored, controlled distribution to domestic recipients, thereby retaining the foreign trade value of the information. By controlling access to applied technology, such information may be exchanged on a quid pro quo basis with other nations having formal agreements with the United States, consistent with the intent of 10 CFR Part 810 regulations.

Applied technology products, as defined by the Director, Office of Nuclear Energy, Science, and Technology, do not include base technology information. Base technology information is defined as information reporting on a fundamental knowledge of nuclear technology but without any information related to engineering, design, construction, or operation of particular projects requiring major funding. Base technology is unlimited information and is not subject to distribution controls.

Products containing information designated as applied technology shall clearly display the Applied Technology Restrictive Legend noted below and shall be prominently marked with Distribution Statement D.

APPLIED TECHNOLOGY

Any further distribution by any holder of this product or data therein to third parties representing foreign interests, foreign governments, foreign companies, and foreign subsidiaries or foreign divisions of U.S. companies shall be approved by the [insert appropriate NE Program Office officials], U.S. Department of Energy. Further, foreign party release may require DOE approval pursuant to 10 CFR 810, and/or may be subject to Section 127 of the Atomic Energy Act.

Use the following to fill in the appropriate NE program office officials in the blank in the statement above.

1.01 For information emanating from the Space and Defense Systems Power Program, the label should read, "Associate Director for Space and Defense Power Systems."

1.02 For information emanating from the Naval Nuclear Propulsion Program, the label should read, "Associate Director for Naval Reactors."

1.03 For information emanating from all other past and current programs, the label should read, "Associate Director for Technology."

In coordination with NE, OSTI performs several information management functions, including maintaining the official distribution lists, coordinating approval for document and software requests, and recording designation removal. Performing these functions requires that OSTI receive applied technology information from document and software originators.

The OSTI official standard distribution lists that have been approved by the NE program office are considered to be the sole distribution for applied technology documents with the exception of internal recipients (not subcontractors or outside program participants). To accomplish this, originating sites submit applied technology documents to OSTI using DOE F 241.1, marked appropriately, as well as a list of internal and external distribution addresses to complete the official distribution record maintained on each applied technology document.

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Applied technology information is not to be presented, referenced, or form the basis of presentations in technical society meetings or journals, meetings with foreign interests (except under pre-approved arrangements), referenced in non-applied technology documents, or other printed or electronic means without prior NE Program Office approval. This restriction includes not referencing information contained within an applied technology document, and also not referencing the report title or number.

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The Atomic Energy Act of 1954, as amended, and Executive Order 12958 serve as the basis for identifying classified information generated by the Department. Classified information is defined as certain information that the United States Government has determined requires protection against unauthorized disclosure for reasons of national security (i.e., Restricted Data, Formerly Restricted Data, and National Security Information).

Procedures for the proper identification of classified information and subsequent marking of classified information products can be found in DOE M 475.1-1, IDENTIFYING CLASSIFIED INFORMATION. An unclassified title and subtitle should be used if the subject matter can be indicated clearly. The classification level and category, including "unclassified," must be indicated on all titles and abstracts to classified products, in accordance with DOE M 475.1-1. Classified STI products generated within DOE should be clearly and prominently provided with an appropriate distribution limitation statement to ensure that recipients will subsequently handle

the STI product appropriately (see also Attachment 7).

- For Secret/Restricted Data Sigma 1, 2, 11, 12, and 13 products, use distribution statement H.
- For Confidential/Restricted Data Sigma 1, 2, and 11 and all other non-Sigma Restricted Data products, use distribution statement G.
- For Non-weapon data Formerly Restricted Data and National Security Information products, use distribution statement F.

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- distribution, by sale or otherwise, in paper or electronically;
- the preparation of derivative works, including translations;
- public display of the material; and
- public performance of the material.

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Declassified STI Products

Classified information products that have been declassified must also be reviewed by the originating site for unclassified but sensitive information. DOE M 475.1-1, IDENTIFYING CLASSIFIED INFORMATION, requires organizations to submit bibliographic information and availability information to OSTI for every document that is declassified and determined to be publicly releasable.

To allow access to the widest audience possible, OSTI would like to receive a classification change notice whenever a classified STI product held by OSTI is declassified by the originating site or higher authority. It is requested that notices of declassification be accompanied by instructions/authority to publicly release or to further control access to the STI product, including the basis for further control. If OSTI has never received the original product, a copy of the declassified document is requested, along with the authorization for public release or control.

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Export Controlled Information (ECI) is information containing technical data as defined in and controlled by U.S. export control statutes. Appropriate laws, regulations, and requirements for ECI include the following:

- The Nuclear Nonproliferation Act of 1978

- The Atomic Energy Act of 1954, as amended, and its implementation by Export and Import of Nuclear Material, Title 10, Code of Federal Regulations, Part 110, and Assistance to Foreign Atomic Energy Activities, Title 10, Code of Federal Regulations, Part 810

- The Export Administration Act of 1979 and its implementation by the Export Administration Regulations, Title 15, Code of Federal Regulations, Parts 730-799

- The Arms Export Control Act and its implementation by the International Traffic in Arms Regulations, Title 22, Code of Federal Regulations, Parts 120-128.

ECI must be clearly identified to ensure appropriate handling of such information by potential recipients. Information designated as ECI is given controlled distribution to prevent unauthorized release to foreign countries, organizations, or individuals.

Such information to be released shall be clearly marked in accordance with the following requirements.

- Markings to be affixed to technical information determined to be ECI may vary depending on the needs and preferences of site or program managers. The preferred format is the Export Controlled Information Restrictive Legend noted below.

  EXPORT CONTROLLED INFORMATION

  Contains technical data whose export is restricted by statute. Violations may result in administrative, civil, or criminal penalties. Limit dissemination to U.S. Department of Energy and major U.S. DOE contractors. The cognizant program manager must approve other dissemination. This notice shall not be separated from the attached document.

  _____ _____
  Reviewer Signature Date

- Products containing ECI must be clearly marked "EXPORT CONTROLLED INFORMATION" at the top and bottom of each page containing ECI.

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Naval Nuclear Propulsion Information is controlled in accordance with Public Law 98-525 (42 U.S.C. 7158). Naval Nuclear Propulsion Information, unclassified or classified, may be released publicly or for dissemination to foreign governments, foreign nationals, or any individual or activity not engaged in work for the naval reactors program only with the specific approval of the Director of the Office of Naval Reactors.

Official Use Only Information

For guidance concerning Official Use Only Information, consult your site or field office technical information office, Freedom of Information Act office, classification office, or legal counsel. For additional consultation, contact the OSTI Classification and Control Officer. Products identified as containing Official Use Only Information shall be clearly marked with Distribution Statement C.

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Federal contractors must safeguard information that discloses any invention when patent rights for the invention will belong to the Federal Government. Federal agencies are authorized to withhold from disclosure to the public, information disclosing any invention in which the Federal Government may own a right, title, or interest, for a reasonable length of time so that a patent application can be filed.

Products containing potentially patentable information must clearly display the Patent Caution Restrictive Legend below; the document must be clearly and prominently marked with Distribution Statement B.

> PATENT CAUTION
>
> This product may contain patentable subject matter protected from unauthorized disclosure under U.S. Patent Law (35 U.S.C. 205). No further dissemination outside of the Government without the approval of the Assistant General Counsel for Intellectual Property, U.S. Department of Energy.

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Proprietary data that arise from DOE financial assistance agreements are controlled in accordance with Title 48, Code of Federal Regulations, Part 952.227, Printing, and Title 5, U.S. Code 552, Freedom of Information Act of 1974. Proprietary data that arise from DOE contracts involving "limited rights data" or "restricted computer software" are defined and controlled in accordance with FAR 52.227-14 and Title 5, U.S. Code 552, Freedom of Information Act of 1974.

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> PROPRIETARY DATA
>
> This technical data contains proprietary data furnished under contract no. ___ with the U.S. Department of Energy. Disclosure outside the Government is not authorized without prior approval of the originator, or in accordance with provisions of 48 CFR 952.227 and 5 U.S.C. 552.

Proprietary data must not be included in any abstract prepared and submitted before the information is announced for availability; the abstract must be suitable for publication.

Protected Battery Information

In accordance with Public Law 102-381, Title II, 106 Stat. 1405, products containing Protected Battery Information must be clearly marked with the Protected Battery Information Restrictive Legend below to prevent disclosure of such information; products so identified must be clearly and prominently marked with Distribution Statement E.

> PROTECTED BATTERY INFORMATION
>
> This product contains Protected Battery Information which was produced under Contract/CRADA No. _____ and is not to be further disclosed for a period of up to five years after the completion of the individual project, or not prior to ___*[date]*___.

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Protected Cooperative Research and Development Agreement (CRADA) information is information produced in the performance of a CRADA that is marked as being Protected CRADA Information by a party to the agreement and that would have been proprietary information had it been obtained from a non-Federal entity.

Products that contain information that is protectable under the terms of a CRADA shall clearly display the Protected CRADA Information Restrictive Legend noted below to prevent disclosure of such information; the document shall be clearly and prominently marked with Distribution Statement E.

> PROTECTED CRADA INFORMATION
>
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Small Business Innovation Research and Small Business Technology Transfer

In accordance with implementing regulations, Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) may be protected for a period of 4 years from the completion of the project, unless written permission to disclose such data earlier is obtained from the contractor or grantee.

To protect STI products (i.e., to limit distribution), the SBIR or STTR products must be clearly marked as containing SBIR or STTR proprietary information; the document must be clearly and prominently marked with Distribution Statement B. The DOE F 241.1 or DOE F 241.3 must be marked accordingly.

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Dissemination of Unclassified Controlled Nuclear Information (UCNI) is prohibited under Section148 of the Atomic Energy Act of 1954, as amended. UCNI is identified and controlled as directed in DOE O 471.1, IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION, and in Title 10, Code of Federal Regulations, Part 1017, Identification and Protection of Unclassified Controlled Nuclear Information.

Products containing information designated as UCNI must clearly display the markings prescribed in DOE O 471.1, IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION; the document must be clearly and prominently marked with Distribution Statement D. The marking, "Unclassified Controlled Nuclear Information" or "UCNI" must be placed on the bottom of the front of the matter and (1) on the bottom of each interior page of the matter or (2) if more convenient, on the bottom of only those interior pages that contain UCNI.

DOE O 471.1 states that any information product "that contains UCNI shall be marked so that both a person in physical possession of the matter (e.g., markings on a viewgraph frame, a film reel and its container) and a person with access to the information in or on the matter (e.g., markings on the projected image of a slide, a warning on a film leader) are made aware that it contains UCNI. When space is limited, as on a 35-millimeter slide, the marking, 'UCNI' will suffice." (from DOE O 471.1).

A non-UCNI title and subtitle must be used for an UCNI information product whenever possible. The title must indicate whether the title does or does not contain UCNI.

TYPICAL COVER FOR TECHNICAL REPORTS

	Preferred Location
DOE STI Product/Report Number	DOE/FE/12345--1
STI Product Title	FEASIBILITY STUDY FOR ADVANCED TECHNOLOGY IN COAL CONVERSION AND UTILIZATION Phase 1
STI Product Type and Reporting Period	Semi-Annual Report for the Period July-December 1999
Date of Issuance or Publication	Date Issued/Published February 2000
Author	John G. Jones
Originating Research Org.	FOSSIL SCIENCES, INC. Waco, Texas 78203
Distribution Statement	Distribution B - Further dissemination authorized to U.S. Government agencies only; other requests shall be approved by the originating facility or higher DOE programmatic authority.

TYPICAL TITLE PAGE FOR TECHNICAL REPORTS

	Preferred Location
DOE STI Product/Report Number	DOE/FE/12345-1
STI Product Title	FEASIBILITY STUDY FOR ADVANCED TECHNOLOGY IN COAL CONVERSION AND UTILIZATION Phase 1
STI Product Type and Reporting Period	Semi-Annual Report for the Period July-December 1999
Date of Issuance or Publication	Date Issued/Published February 2000
Author	John G. Jones
Sponsoring Organization	PREPARED FOR THE UNITED STATES DEPARTMENT OF ENERGY/OFFICE OF FOSSIL ENERGY
Award/Contract/Financial Number	Work Performed Under Contract No. AC02-99FE12345

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Office of Scientific and Technical Information
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A	Approved for public release; further dissemination unlimited. (Unclassified Unlimited)
B	Further dissemination authorized to U.S. Government agencies only; other requests shall be approved by the originating facility or higher DOE programmatic authority. (Patent Caution; Proprietary; SBIR; STTR)
C	Further dissemination authorized to U.S. Government agencies and their contractors; other requests shall be approved by the originating facility or higher DOE programmatic authority. (OUO)
D	Further dissemination authorized to the Department of Energy and DOE contractors only; other requests shall be approved by the originating facility or higher DOE programmatic authority. (UCNI; ECI; applied technology)
E	Further dissemination authorized to the Department of Energy only; other requests shall be approved by the originating facility or higher DOE programmatic authority. (Protected CRADA; Protected Battery Information)
F	Further dissemination only as authorized by the originating facility or higher DOE programmatic authority; requester must possess appropriate security clearance, need-to-know, and facility approval for receipt and storage of classified documents by the DOE Office of Security Affairs. (Non-weapon data FRD; NSI)
G	Further dissemination only as authorized by the originating facility or higher DOE programmatic authority; requester must possess appropriate security clearance, Restricted data access authorization, need-to-know, and facility approval for receipt and storage of classified documents by the DOE Office of Security Affairs. (Confidential, Sigmas 1,2,11; all Sigmas 3,4,5,9,10; all other non-weapon data RD)
H	Further dissemination only as authorized by the Director of Military Application or directed by the DOE Weapon Data Control Officer (DP-45); requestor must possess DOE Q clearance or equivalent, Restricted Data access authorization, need-to-know, and facility approval for receipt and storage of classified documents by the DOE Office of Security Affairs. (SRD, Sigmas 1,2,11,12,13)

Distribution Statement	Applicable Information Category
A	Unclassified Unlimited
B	Patent Caution; Proprietary Data; SBIR; STTR
C	Official Use Only
D	Unclassified Controlled Nuclear Information; Export Controlled Information; applied technology
E	Protected CRADA; Protected Battery Information
F	Non-weapon Data FRD; NSI
G	CRD Sigmas 1, 2, 11; All other non-Sigma RD
H	SRD Sigma 1, 2, 11, 12, 13

SUBJECT CATEGORIES

01	**Coal, Lignite, and Peat** Information supporting research on coal and coal products, including lignite and peat, should be included in this category. As energy sources, research in these areas includes reserves, geology and exploration; mining; preparation; processing; products and by-products; properties and composition; combustion; transport, handling and storage; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
02	**Petroleum** Information supporting research on petroleum is covered in this category. As an energy source, research in this area includes reserves, geology, and exploration; drilling and production; processing; products and by-products; properties and composition; combustion; transport, handling, and storage; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
03	**Natural Gas** Information supporting research on natural gas including liquefied natural gas is covered in this category. As an energy source, research in this area includes reserves, geology, and exploration; drilling, production, and processing; products and by-products (e.g., LPG); properties and composition; combustion; transport, handling, and storage; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
04	**Oil Shales and Tar Sands** Information supporting research on oil shales and tar sands should be included in this category. As an energy source, research in this area includes reserves, geology, and exploration; drilling, fracturing, and mining; oil production, recovery, and refining; products and by-products; properties and composition; combustion; transport, handling, and storage; waste management, environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
07	**Isotopes and Radiation Sources** Information in the isotope and radiation source technology area include physical isotope separation; radiation sources; isotopic power supplies; economic, industrial, and business aspects; health and safety; environmental aspects; and regulation and licensing.
08	**Hydrogen** This renewable energy area includes hydrogen production; products and by-products; properties and composition; combustion; storage, transport, and handling; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.

Subject Categories (continued)	
09	**Biomass Fuels** This renewable energy area covers energy crops and wastes used directly as fuels, e.g., wood, straw, municipal wastes; fuels derived from energy crops and wastes, e.g., methane, ethane, ethanol; and biogas from sanitary landfills. Aspects include resources; production; processing; products and by-products properties and composition; combustion; storage, transport and handling; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
10	**Synthetic Fuels** This renewable energy area includes fuels produced by chemical synthesis, e.g., inorganic hydrogen compound fuels, town gas, etc. Aspects include production; properties and composition; combustion; products and by-products; storage, transport and handling; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
11	**Nuclear Fuel Cycle and Fuel Materials** This category includes information on the nuclear fuel cycle except for fuel element design, assembly, and performance and waste management. It includes reserves, exploration, and mining; feed processing; uranium enrichment; fuels production and properties; spent fuels reprocessing; transport, handling, and storage; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
12	**Management of Radioactive Wastes, and Non-radioactive Wastes from Nuclear Facilities** This category includes the treatment, transport, storage, disposal, safety, and legal aspects of radioactive wastes and spent fuels. It includes processing, disposal, interim or ultimate storage of radioactive wastes, including transmutation technology; processing and disposal of non-radioactive wastes generated by nuclear facilities; radioactive waste treatment plants, structures, and equipment; and tritium processing, containment, and recovery.
13	**Hydro Energy** This renewable energy area includes hydroelectric power plants, retrofitting existing dams for power, hydroelectric-dam safety and environmental studies, and generating equipment. It also includes the extraction of energy from the Florida Current, Gulf Stream, or undammed, free-flowing streams. Aspects include resources and availability; site geology and meteorology; plant design and operation; power-conversion systems; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.

Subject Categories (continued)	
14	**Solar Energy** This renewable energy area includes conversion of solar radiation to useful amounts of electric energy, use of solar energy for heating and cooling, or any other use of solar energy that might contribute to the total energy budget. All technical aspects of the design, research and development, manufacture, testing, and operation of solar cells and solar collectors are included along with photovoltaic power systems, solar thermal power systems, ocean energy systems and solar thermal use. Also includes materials with indicated utility in solar cells or solar converters. Aspects include resources and availability; environmental aspects; solar energy conversion; heat storage; health and safety; legislation and regulations; and economic, industrial, and business aspects.
15	**Geothermal Energy** This renewable energy area includes aspects of geothermal resources and availability; geology and hydrology of geothermal systems; geothermal exploration and exploration technology; products and by-products; geothermal power plants; geothermal engineering; direct energy use; geothermal data and theory; waste management; environmental aspects; health and safety; legislation and regulations; and. economic, industrial, and business aspects.
16	**Tidal and Wave Power** This renewable energy area includes the aspects of tidal and wave power resources and availability; tidal power plants and power conversion systems; wave energy converters; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
17	**Wind Energy** This renewable energy area includes the aspects of wind resources and availability; wind energy engineering including applications, turbine design and operation, and power-conversion systems; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
20	**Fossil-Fueled Power Plants** This category is primarily for utility-size fossil-fueled power plants. Routine aspects of power plant hardware use are not included, but new designs, developments, and technologies are appropriate. This hardware includes fuses, motors, turbines, generators, and standard electrical components. Aspects include components and operation of power plants and power generation; waste management; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.

Subject Categories (continued)	
21	**Specific Nuclear Reactors and Associated Plants** This area covers the design, development, construction, and operation of specific fission reactors. Types of reactors include power (both nonbreeding and breeding), mobile, package, transportable, research, production, and propulsion reactors. Aspects of related safety, regulation, licensing, economics, and environmental impacts are included.
22	**General Studies of Nuclear Reactors** This area covers general studies of reactor physics and engineering of reactors of unspecified type. Aspects of reactors and their accessories and components (fuel elements, control systems, etc.), environmental impacts, and safety are also included.
24	**Power Transmission and Distribution** The area of power transmission and distribution includes the design, development, and new technologies of power systems and power transmission from any source. Hardware includes transformers, switchgear, converters, and cables. Aspects include power systems; power systems networks, transmission, and distribution; power transmission lines and cables; environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
25	**Energy Storage** Methods for storing energy in a readily recoverable form for later use are covered in this area. Such methods may be mechanical, chemical, electromagnetic, or thermal, and include magnetic energy storage, compressed and liquefied gas, capacitor banks, flywheels, thermal energy storage, and chemical energy storage, e.g. batteries. Aspects include environmental aspects; health and safety; legislation and regulations; and economic, industrial, and business aspects.
29	**Energy Planning, Policy and Economy** This area is for information dealing with all aspects of energy planning, policy, and policy analysis. Planning and policy aspects covered include organizational aspects; regulations and legislation; conservation and consumption of energy resources; supply and demand; economic evaluations and cost comparisons; shortages, including blackouts and brownouts; long- and short-term planning; research, development, demonstration, and commercialization in new technology; total energy systems; district heating and cooling; combined cycles in energy management; energy transport, e.g., pipelines; and liquid hydrogen. Aspects also include energy analysis and modeling; economics and sociology; environment, health, and safety; nuclear energy; transport and storage; heat use; and policy aspects of fossil fuels, hydrogen and synthetic fuels, electric power, and unconventional sources and power generation.

Subject Categories (continued)	
30	**Direct Energy Conversion** This area includes methods and devices for converting heat or other forms of energy into electrical energy without intermediate conversion into mechanical work. Aspects include MHD generators; EHD generators; thermoelectric generators; thermionic generators; fuel cells; and miscellaneous convertors.
32	**Energy Conservation, Consumption, and Use** This area includes information on equipment and methods to reduce energy consumption, increase energy efficiency, or to enable the substitution of more plentiful or environmentally favorable energy sources. The area includes energy conservation within buildings, in transportation, in industry and agriculture, and within municipalities and communities.
33	**Advanced Propulsion Systems** This area has design and development of advanced propulsion systems for automobiles, buses, trucks, ships, aircraft, and trains—e.g., power plants, components, and devices that promise better fuel economy, less maintenance, and increased service life; more-efficient power cycles; better emission-control devices; and feasibility studies on the use of alternative fuels such as hydrogen or alcohol fuels. Aspects include internal combustion engines; external combustion engines; electric-powered systems; hybrid systems; flywheel propulsion; vehicle design factors; emission control; and alternative fuels.
36	**Materials Science** The Materials Science subject area provides information on materials research associated with energy production, conversion, or use or with studying radiation effects on materials. Studies of metals, alloys, ceramics, cermets, refractories, composites, polymers, plastics and other materials included here.
37	**Inorganic, Organic, Physical, and Analytical Chemistry** Chemical information useful to researchers in an energy-related area of analytical and separations chemistry; inorganic, organic, and physical chemistry; electrochemistry; photochemistry; and combustion, pyrolysis and high-temperature chemistry is provided in this subject area. Isotope effects on properties of elements and compounds and isotope exchange are also categorized here. Both basic and applied areas of energy-related chemistry are included.
38	**Radiation Chemistry, Radiochemistry, and Nuclear Chemistry** Hot-atom chemistry (chemical reactions of atoms or ions of high kinetic energy (more than 1 eV) resulting from nuclear transformations), properties of radioactive materials, preparation of radioactively labeled compounds (including chemical separation and preparation of radioisotopes), and radiation chemistry (radiation-induced chemical reactions, G value determination, chemical radiation effects on solids, liquids, and gases) are included in this category.

Subject Categories (continued)	
42	**Engineering** This subject area encompasses general engineering information directly related to energy, including facilities, equipment and techniques; heat transfer and fluid flow; materials testing; combustion systems; mining and underground engineering; marine engineering; power cycles; components, electron devices and circuits; and peaceful uses of nuclear explosions.
43	**Particle Accelerators** Information to support the design, development, operation and components of particle accelerators used in energy research should be included in this category. Topics include beam dynamics, field calculations, and ion optics; auxiliaries and components; and storage rings.
45	**Military Technology, Weaponry, and National Defense** This category includes information related to national defense. Aspects of conventional and nuclear weapons such as chemical explosions and explosives; nuclear explosions and explosives; nuclear explosion detection; nuclear and radiological warfare; strategic defense initiative; and chemical and biological warfare are covered.
46	**Instrumentation Related to Nuclear Science and Technology** This category includes particle and radiation detectors and monitors (such as radiation dosimeters, nuclear spectroscopic instrumentation, high-energy physics instrumentation, and radiometric instruments) as well as other nuclear science-related instrumentation such as flowmeters, pressure gages, and heat sensors. Radiation effects on instruments and electronic systems are also categorized here.
47	**Other Instrumentation** Instrumentation associated with energy research and energy source exploitation, including instruments used in well logging and in thermal, optical, geophysical, meteorological, and miscellaneous applications is covered in this area. [Instrumentation related to nuclear science and technology can be found in category 46.]
54	**Environmental Sciences** The environmental sciences subject area is defined as information on the effects of any energy-related activity on the environment, on methods for mitigating or eliminating adverse effects, and on technical aspects of ensuring that energy-related activities are environmentally safe and socially acceptable. This area covers all aspects of global climate change. Monitoring and transport of chemicals, radioactive materials and thermal effluents within the atmospheric, terrestrial and aquatic environs are covered.
58	**Geosciences** This area is limited to providing information to support research in geosciences where the context of the work is energy technology. Aspects of geology, geography, seismology and geochemistry are covered when energy related.

Subject Categories (continued)	
59	**Basic Biological Sciences** This area includes studies of living organisms and components of living organisms; identification of functions, activities, and phenomena associated with these organisms; and studies to establish norms from which effects of energy production, conversion, or use can be determined. Topics include behavioral biology; biochemistry; cytology; genetics; metabolism; microbiology; morphology; pathology; and physiological systems.
60	**Applied Life Sciences** The following topics are contained in the applied life sciences area: plant cultivation and breeding (crop and plant improvement by development of mutants, plant nutrition, metabolism, fertilizer use, irrigation studies, assessment of seed quality, stimulation of plant growth); pest and disease control related to human, animal, and plant parasitic diseases, to pathogens, and to disease transmission; procedures in vaccine production and reactions of organisms to such vaccines; pest ecology, pesticides, and insect control; food protection, preservation, and human nutrition evaluation (procedures for food and animal feed, extension of storage life, disinfestation, food quality and monitoring); and animal husbandry (nutrition, metabolism, and breeding of domestic animals, veterinary science). The use of radiation in the above contexts is included.
61	**Radiation Protection and Dosimetry** This subject area includes radiation protection standards dealing with the presence of radioactive materials or with the operation of reactors or other nuclear equipment or facilities; radiation protection procedures to provide radiation protection, decontamination, and prevention of contamination; and dosimetry and monitoring of patients and medical personnel (population dose estimates; collective dose and dose commitment (from background radiation, radiation accidents, medical or industrial use of radioisotopes and ionizing radiation, or contaminated food); absorbed doses in man, animals, plants, and other biological systems, as well as tissue-equivalent materials and phantoms). Also included in this category are legal aspects of protecting personnel, the public, and the environment against contamination.
62	**Radiology and Nuclear Medicine** The use of external radiation and radioisotopes in diagnosis and therapy is categorized here. Radiations include x rays, bremsstrahlung, gamma rays, neutrons, and charged particles. The use of stable isotopes in diagnostic procedures as well as other medical techniques are included in this subject area.

Subject Categories (continued)	
63	**Radiation, Thermal, and Other Environmental Pollutant Effects on Living Organisms and Biological Materials** This area includes studies of the effects of nuclear particles, accelerated electrons and ions, gamma rays or x rays on living organisms, including cells, microorganisms, or biochemicals; of ultraviolet light effects on microorganisms, cells, or biochemicals; effects of thermal effluents from energy production, use, conservation, or other thermal discharges on living organisms; metabolism and toxicology of chemicals associated with an energy cycle; effects of noise produced in energy production, conversion, or use; effects from global climate changes; and health hazards from any energy-related activities.
70	**Plasma Physics and Fusion Technology** This subject area includes aspects of plasma physics and fusion including plasma production, kinetics, processes and confinement. Fusion technology, specifically fusion devices and systems, is also covered within this area.
71	**Classical and Quantum Mechanics, General Physics** Aspects of physics included here are classical mechanics of interest for energy science and technology, general aspects of quantum mechanics and scattering theory, basic cryogenic studies, vacuum production and techniques at cryogenic temperatures, beam production and transport of beams (electron, neutron, ion, atomic, and molecular) not for specific applications, nonisotopic sources (electron, neutron, ion) not developed for specific applications, and other physical sciences such as statistical physics, thermodynamics, electricity and magnetism, electrodynamics, optics, acoustics, etc.
72	**Physics of Elementary Particles and Fields** The physics of elementary particles and fields includes the theory of fields and strings; Schwinger source theory; Bethe-Salpeter equations; relativistic wave equations; symmetry; conservation laws; currents and their properties; S-matrix theory; Regge formalism; relativistic scattering theory; unified theories and models; quantum electrodynamics (QED); quantum chromodynamics (QCD); models for strong interactions; studies of specific particle interactions, decays, and processes; and properties of specific particles and resonances.
73	**Nuclear Physics and Radiation Physics** This subject category includes the properties of nuclei and nuclear energy levels, nuclear structure models and methods, nuclear radioactivity and electromagnetic transitions, and nuclear reactions and scattering. It also includes the physics of nuclear and elementary particles as they interact with and pass through bulk matter.

Subject Categories (continued)	
74	**Atomic and Molecular Physics** In this category are found documents on the electronic structure and energy-level transitions of atoms and molecules; atomic and molecular spectra; interactions of atoms and molecules with photons; collision phenomena (for collisions of electrons, ions, atoms, and molecules with one another); and properties of atoms and molecules, including positronium, muonium, muonic and mesic atoms and molecules, and hyperonic atoms and molecules.
75	**Condensed Matter Physics, Superconductivity, and Superfluidity** The following topics are categorized here: advances in the use of nuclear techniques or measurement methods in studies of the structure of solids and liquids; solid-state plasma; physics of surfaces, interfaces, and thin films; interactions of beams (photons, electrons, positrons, neutrons, ions, atoms, and molecules) with condensed matter, where the interest is in the effect itself at the microscopic level and not in the material in which it takes place; Auger emission; sputtering; and quantum physics aspects of condensed matter (superconductivity, superconducting devices, superfluidity, etc.)
98	**Nuclear Disarmament, Safeguards, and Physical Protection** The arms control area includes information on negotiations and treaties to reduce weapon stockpiles, on limiting the spread of weapon technologies, and on verification of compliance with such agreements. Aspects include policy, negotiations, and legislation; proliferation; verification (including remote and on-site inspections); physical protection; nuclear safeguards; and nuclear materials management.
99	**General and Miscellaneous//Mathematics, Computing, and Information Science** This section is intended to support research interests by energy organizations in the disciplines of mathematics, computing and information science, and general law. Research in these areas includes supercomputing, mathematical and computer modeling, computer programming, and information systems. Generally, this research supports some facet of energy technology.

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